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**PROCEEDINGS**  
**OF THE**  
**AMERICAN SOCIETY**  
**OF**  
**CIVIL ENGINEERS**

**VOL. XLVII—No. 5**

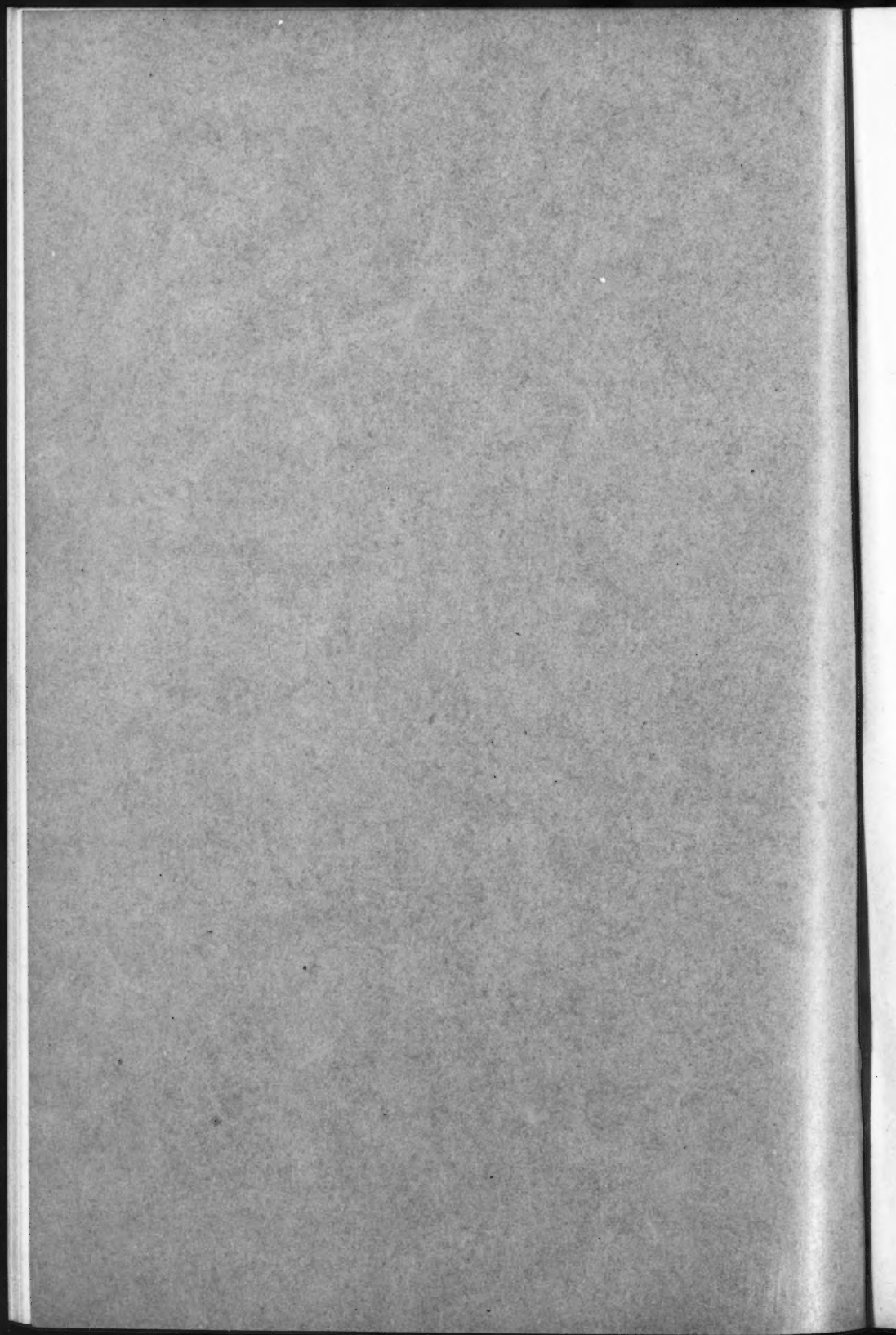


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# AMERICAN SOCIETY OF CIVIL ENGINEERS

INSTITUTED 1852

## PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed in its publications.

### SOCIETY AFFAIRS

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### MINUTES OF MEETINGS OF THE SOCIETY

#### FIFTY-FIRST ANNUAL CONVENTION HELD IN HOUSTON, TEX., APRIL 27th-30th, 1921.

##### FIRST SESSION\*

**Wednesday, April 27th, 1921.**—The meeting was called to order in the Rice Hotel, Houston, Tex., at 10 A. M.; J. H. Brillhart, M. Am. Soc. C. E., President of the Texas Section of the Society, presiding; Herbert S. Crocker, Acting Secretary; and present, also, 296 members and guests.

Addresses of welcome were made by the Hon. Pat M. Neff, Governor of Texas, and by Mayor Holcombe of Houston. Speaking for the local engineers, E. E.

\* For the Report in full of this meeting, see p. 465.

Sands, M. Am. Soc. C. E., read a description of the public works and industrial developments of Houston and vicinity.\*

President Webster responded to the addresses of welcome and, after brief remarks by E. B. Cushing, M. Am. Soc. C. E., Chairman of the Local Committee of Arrangements, delivered the Annual Address.†

A motion by Arthur P. Davis, Past-President, Am. Soc. C. E., extending a hearty invitation to all the citizens of the vicinity, and especially engineers, to attend the sessions of the Convention, was duly seconded and unanimously carried by a rising vote.

President Webster took the chair. The Acting Secretary read a report of the Alfred Noble Memorial Committee‡ which, on motion duly seconded and carried, was received, announced the election and transfer of members by the Board of Direction on April 25th, 1921,§ and read the list of deaths.||

President Webster announced the recent action of the Board of Direction in regard to the following: Change in the method of publishing papers and discussions; appointment of a Committee to Promote the Technical Interests and Activities of the Society; and the work of the Committee on Research.¶

On motion, duly seconded, it was voted to defer the consideration of the report of the Committee on Referred Amendments to the Constitution which was presented by its Chairman, until the afternoon session of the Business Meeting. A motion to adopt the report was made and seconded, but action was deferred.

The meeting recessed to meet at 2 P. M.

## SECOND SESSION—BUSINESS MEETING

**Wednesday, April 27th, 1921.**—The meeting was called to order at 2.20 P. M.; President George S. Webster in the chair; Herbert S. Crocker, Acting Secretary; and present, also, about 220 members and guests.

The Acting Secretary read the resolutions regarding the proposed revised Constitution which had been passed by Local Sections of the Society and sent to the Convention by the Louisiana Section, the Illinois Section, the Spokane Section, the New York Section, the San Francisco Section, and the Cincinnati Section. He also read a letter from Edward W. Howe, M. Am. Soc. C. E., proposing changes in the figures for compounded dues in the proposed new Constitution, Article IV, Section 5. The question was raised as to the number of members of the Society who had been present at the various Local Section meetings when action was taken, and the available information was presented to the Convention.

George G. Anderson, M. Am. Soc. C. E., moved a substitution for the proposed form of Article I, Section 3, stating the objects of the Society. After a discussion of parliamentary procedure, Mr. Anderson's motion was discussed by Messrs. Taylor, Norcross, Hidinger, Grunsky, Coleman, Chester, Davis, Stuart, and Nagle, and was lost by an "aye" and "no" vote.

\* See p. 467.

† Printed on pages 43 to 53 of Papers and Discussions.

‡ See p. 475.

§ See p. 476.

|| See p. 476.

¶ See p. 476.

A correction\* to Article VII, Section 3, in the proposed new Constitution, on motion, duly seconded, and with the assent of members of the Committee, was authorized by an "aye" and "no" vote.

A proposal to amend Article VII, Section 1, by omitting the provision that members not residing in North America shall be allocated to District No. 1, was made by J. N. Chester, M. Am. Soc. C. E., and discussed by Messrs. Junkersfeld, Williams, O'Hearn, Humphrey, Henny, Crocker, Chamblin, and Estes, but no action was taken, a motion to that effect being considered to be out of order.

After discussion regarding parliamentary procedure, a motion to accept the report of the Committee on Referred Amendments submitting the proposed revised Constitution and discharge the Committee was postponed until the provisions of the revised Constitution could be discussed.

A motion to revise the wording of the second paragraph of Section 9, Article VII, of the Constitution as proposed was made by Gardner S. Williams, M. Am. Soc. C. E., duly seconded, discussed by Messrs. Junkersfeld, Crocker, Sands, Butler, Bantel, Bartlett, and Williams, and was lost by an "aye" and "no" vote.

Mr. Chester moved that the Convention, as the sense of the meeting, instruct the Committee on Referred Amendments to omit the provision for allocating members not residing in North America to District No. 1. This motion was discussed by Mr. Taylor, and failed to carry.

Motions to adopt the proposed revised Constitution and By-Laws, with the amendments, were duly seconded and carried, the report of the Committee on Referred Amendments was approved, and that Committee was discharged with the thanks of the Society for its excellent work.

On motion, duly seconded and carried, the Chair was authorized to appoint a committee of three to prepare suitable resolutions to express the gratitude of the members to the Local Committee for the entertainment provided at the Convention. President Webster subsequently appointed Messrs. Gardner S. Williams and H. S. Crocker, Members, Am. Soc. C. E., and Arthur N. Talbot, Past-President, Am. Soc. C. E., as such Committee, and the resolutions† were transmitted as instructed.

Adjourned.

**May 4th, 1921.**—The meeting was called to order at 8.10 p. m.; Director John P. Hogan in the chair; J. P. J. Williams, Assoc. M. Am. Soc. C. E., acting as Secretary; and present, also, 121 members and guests.

The minutes of the meeting of April 6th, 1921, were approved as printed in *Proceedings* for April, 1921.

Announcements regarding a letter-ballot‡ by the Board of Direction for Secretary of the Society which was canvassed on April 25th, 1921, and of the election on the following day of Elbert M. Chandler, M. Am. Soc. C. E., as Acting Secretary, were made.

The Chairman introduced the speaker of the evening, Ernest E. Howard, M. Am. Soc. C. E., of Kansas City, Mo. Mr. Howard presented a paper entitled "Vertical

\* See p. 491.

† See p. 507.

‡ See p. 447.

Lift Bridges" and described in detail, by the use of an exceptionally complete set of lantern slides, the development of the lift bridge, including general elements and modifications of design, and typical examples of bridges with lifting spans, lifting decks, and a combination lifting span with lifting deck. The subject was discussed by Messrs. D. B. Steinman, S. Hardesty, T. Kennard Thomson, and Thomas E. Brown.

The following deaths were announced:

GEORGE PIERREPONT BLAND, of Philadelphia, Pa., elected Junior, April 7th, 1875; Member, May 4th, 1881; died April 18th, 1921.

SAMUEL EVERETT TINKHAM, of Boston, Mass., elected Member, March 2d, 1892; died April 21st, 1921.

PRESTON KING YATES, of New York City, elected Junior, June 6th, 1883; Member, April 5th, 1893; died April 22d, 1921.

Adjourned.

#### ELECTIONS AND TRANSFERS BY THE BOARD OF DIRECTION, APRIL 25TH AND 26TH, 1921

##### ELECTED AS MEMBERS

DUFF ANDREW ABRAMS, Chicago, Ill.

JOHN CARL AMIS, East Tawas, Mich.

EDWARD ROBERT ARMSTRONG, Wilmington, Del.

JAMES FRANK BARBER, Philadelphia, Pa.

BASIL CONDON BATTYE, Rupar, Punjab, India

CHARLES CALVIN BURGESS, Pittsburgh, Pa.

CHARLES WEEDON COCHRAN, Camp Benning, Ga.

OSCAR FREDERICK DALSTROM, Chicago, Ill.

FRED REED DUNGAN, Boulder, Colo.

ALEXANDER GIBB, London, England

EOLINE RICHMOND HAND, Washington, D. C.

HAROLD JAY HARDER, Paterson, N. J.

CLARK ELLSWORTH JACOBY, Kansas City, Mo.

JOHN PATRICK KELLY, Buffalo, N. Y.

EDWARD ABNER MAY, Patchogue, N. Y.

EDMUND FREDERICK PETERSEN, Texarkana, Ark.

KINGSBURY SANBORN, Riverside, Cal.

PHILIP SAWYER, New York City

WILLIAM HENRY SMITH, Cleveland, Ohio

AUGUST VERNER HUGO VON HEIDENSTAM, Shanghai, China

HANS GOTTHARD WACHTMEISTER, Malmo, Sweden

PHILIP ALBERT WELKER, Washington, D. C.

##### ELECTED AS ASSOCIATE MEMBERS

JOHN JOSEPH BLACKER, New York City

ROBERT BLEMKER BROOKS, St. Louis, Mo.

WARD PHELPS CHRISTIE, Washington, D. C.

ALBERT BRETT CLUNAN, New York City



FRANK BIGELOW COOK, JR., Oakland, Cal.  
JOHN LEFLORE CUMMINGS, Meridian, Miss.  
HENRY HYMAN DAMON, Roxbury, Mass.  
MORTIMER LEVERING DIVER, San Antonio, Tex.  
CHARLES PUTNAM DUNN, Seattle, Wash.  
ERNEST WERNER EICHELBERG, Washington, D. C.  
CARL STEPHENS ELL, Boston, Mass.  
NORVAL ENGER, Ephrata, Wash.  
JOHN WYCKOFF FENTON, Philadelphia, Pa.  
VILHELM FLINDT, Storm Lake, Iowa  
OTTO GAERTNER, New York City  
LORAN DE LANCY GAYTON, Chicago, Ill.  
JACOB MICHAEL GRAY, New York City  
CLIFFORD AYLWARD HAHN, Boston, Mass.  
MARK ARTHUR HAMMOND, Newark, N. J.  
JOSEPH WASHBURN HAWKINS, Atlanta, Ga.  
JEAN HODGKINS HAWLEY, Washington, D. C.  
BENJAMIN JOHN HICKEY, New York City  
WALTER BERKELEY HINKLE, Echo, Ore.  
ALVA EARL HOME, Belleville, Kans.  
CHARLES HASKILL INGLE, Philadelphia, Pa.  
NICHOLAS MICHAEL ISABELLA, Milwaukee, Wis.  
FREDERICK CARLYLE JAMES, Roanoke, Va.  
JAMES MOUNT JOHNSON, San Antonio, Tex.  
THEODORE REED KENDALL, South Nyack, N. Y.  
WILLIAM DANIEL KRAMER, Scarborough, N. Y.  
HERMAN FOX LAME, Jersey City, N. J.  
COLUMBUS GRANT LANDON, Oklahoma City, Okla.  
HARRY EDMUND LINDLEY, Atlanta, Ga.  
GABRIEL EMANUEL LUND, Cayo Mambi, Oriente, Cuba  
WILLIAM GEORGE LUTZ, Brooklyn, N. Y.  
GEORGE CARL MATTISON, Washington, D. C.  
AUGUSTUS BRADFORD MERRY, Cleveland, Ohio  
FRANK BERNARD MILLER, Cleveland, Ohio  
WALTER GRADY MILLER, Moultrie, Ga.  
ALLEN WALTER MOSLEY, Stanberry, Mo.  
SENICHIRO NAKAKURA, Tokyo, Japan  
FLOYD REED NAYLOR, Dallas, Tex.  
FLOYD PETER OBBE, Toledo, Ohio  
RAYMOND O'DONNELL, State College, Pa.  
ROGER WILLIAMS PARKHURST, New York City  
ARMANDO CARLOS PRADAS DE LATORRE, Camagüey, Cuba  
ROBERT WILSON REED, Buffalo, N. Y.  
JOHN AUGUSTINE ROWE, Kokomo, Ind.  
GEORGE HENRY RUSSELL, Lamar, Colo.  
OLIVER JAY SCHIEBER, Big Creek, Cal.  
FRANK ALEXANDER SCHMIDT, Chester, Pa.

THOMAS SCOTT, Atlanta, Ga.  
PAUL GLADSTONE SHANOR, Midland, Pa.  
GEORGE ELDRIDGE SKILLMAN, Jr., New York City  
RAPHAEL VALENTIN SORONDO, Havana, Cuba  
WILLIAM ALVA STEWART, Akron, Ohio  
RIED HERRICK STONE, Wilmette, Ill.  
EDWARD JUSSLEY THOMAS, Wilmington, Del.  
LEE SMITH TRAINOR, Centralia, Ill.  
WILLIAM FOSTER TRIMBLE, Jr., Pittsburgh, Pa.  
JOHN DOUGLAS WALDROP, Greensboro, N. C.  
CHARLES JOHNSON WARD, Columbus, Ohio  
LEWIS CLEMENT WATERBURY, Tompkinsville, N. Y.  
GEORGE JAY WATSON, Elmira Heights, N. Y.  
JOHN JAMES WHEAT, Beaumont, Tex.  
JOHN JOSEPH WHITE, Harriman, Pa.  
JOSEPH GUSTAVUS WILBURN, Atlanta, Ga.  
HARRISON WALTER WILKISON, Dwight, Kans.  
GEORGE WALTER GARNHAM WILLIAMS, Durban, Natal, South Africa  
STANLEY NEALE WILLIAMS, Westfield, N. J.  
RAY BONNER WORTHY, Rancagua, Chile  
WILLIAM ZIMMERMAN, Thurber, Tex.

## ELECTED AS JUNIORS

BENJAMIN HARRISON CHRISTOPHER, Jr., New York City  
JOHN SINGLETON GREEN, Jr., Manchester, England  
EARL OSCAR HEATON, Washington, D. C.  
DUDLEY HARWOOD JONES, Shawnee, Okla.  
GEORGE KLEINKNECHT, West New York, N. J.  
MAURICE ALBERT LEVY, Ambridge, Pa.  
FREDERICK WARREN LOOK, Kingston, N. Y.  
WILLIAM MILLS McDOWELL, Little Rock, Ark.  
PAYSON AUSTIN PERRIN, Worcester, Mass.  
WILLIAM SPIVAK, Brooklyn, N. Y.

## TRANSFERRED FROM ASSOCIATE MEMBER TO MEMBER

HORACE FRANCIS ANTHONY, Detroit, Mich.  
FRANK CHARLES BOES, East Aurora, N. Y.  
JULES ROWLEY BREUCHAUD, New York City  
HENRY EDWARD COANE, Melbourne, Victoria, Australia  
FREDERICK HOSMER COOKE, Washington, D. C.  
THEODORE STUART DELAY, Creston, Iowa  
WILLIAM CLANEY EDGAR, Pittsburgh, Pa.  
FREDERICK WILLIAM EPPS, Topeka, Kans.  
HARRY BAYARD FRIEDMAN, Fort Worth, Tex.  
WILLIS GEORGE FROST, Redwood City, Cal.  
E. RAY GRIFFIN, Mandan, N. Dak.  
HUBERT HARRY HALL, San Francisco, Cal.

FREDERICK NATHANIEL HATCH, New York City  
WARREN BYRON KEIM, Harrisburg, Pa.  
WALTER JOSEPH KNIGHT, St. Louis, Mo.  
HOMER VIRGIL KNOUSE, Omaha, Nebr.  
CLARENCE EDWARD LONG, Pittsburgh, Pa.  
JOHN ORR MACFEETERS, Glen Ridge, N. J.  
JOHN DOUGLAS MATHESON, Yonkers, N. Y.  
DALTON MOOMAW, South Bend, Ind.  
ARCHIBALD E. PALEN, Denver, Colo.  
ALLEN JETER SAVILLE, Richmond, Va.  
ARTHUR VALL SPINOSA, Braddock, Pa.  
HARRY SEEL STANTON, Wilmington, Del.  
HORACE STRINGFELLOW, Washington, D. C.  
WALTER WARD, King Hill, Idaho  
RALPH MERVINE WARFIELD, Santo Domingo, Dominican Republic  
ALBERT JONES WILLIS, Brookings, S. Dak.  
JAMES BAKER WOODSON, Fresno, Cal.

TRANSFERRED FROM ASSOCIATE TO MEMBER

JOHN CRESSON TRAUTWINE, Jr., Philadelphia, Pa.

TRANSFERRED FROM ASSOCIATE TO ASSOCIATE MEMBER

JESSE HERBERT LIBBERTON, New York City

TRANSFERRED FROM JUNIOR TO ASSOCIATE MEMBER

WILLIAM TRENHOLM HOPKINS, Philadelphia, Pa.  
HAROLD STEPHENS HUTTON, Pittsburgh, Pa.  
RAYMOND MATTHEW, San Francisco, Cal.  
FREDERICK THURLOUGH MORSE, Topeka, Kans.  
ROLAND AUGUST MUENSTER, Brownsville, Tex.  
ARMANDO DE ARRUDA PEREIRA, Santos, Brazil  
ALBERT BRUCE PUDDICOMBE, Shanghai, China  
REUBEN BENJAMIN SLEIGHT, Laingsburg, Mich.  
DAVID LINDSAY STRUTHERS, Wilmington, N. C.  
STACEY HARRISON WIDDICOMBE, Phoenixville, Pa.

## OF THE BOARD OF DIRECTION

(Abstract)

**April 25th, 1921.**—The Board reconvened at 10.07 A. M., at the Rice Hotel, Houston, Tex.; President Webster in the chair; H. S. Crocker, Acting Secretary; and present, also, Messrs. Anderson, Brown, Cummings, Darrow, Davis, Grunsky, Henny, Hovey, Hoyt, Hudson, Humphrey (came in at 10.45), McConnell, Pegram, Talbot, and Wall.

The minutes of the meetings of the Board of Direction of March 7th and 8th, 1921, were approved. Later in the meeting, on motion of Director Humphrey, the Acting Secretary was instructed to include in the minutes of the Board of Direction of March 7th, 1921, a statement by Acting Chairman Humphrey of the Publication Committee regarding the saving\* effected by receiving bids on the Year Book of 1921.

Past-President Davis moved that the Board proceed with the regular order of business. The motion was seconded by Director Henny and carried.

The President appointed Messrs. Grunsky and Hudson as Tellers to canvass the Membership Ballot. The Tellers subsequently reported and the President declared the election of candidates.†

## REPORT OF LIBRARY COMMITTEE.

The Acting Secretary read the following report of the Library Committee:

"APRIL 18th, 1921.

"TO THE BOARD OF DIRECTION

AMERICAN SOCIETY OF CIVIL ENGINEERS:

"Your Committee has held one meeting since the March 7th Board Meeting.

"The request of Secretary Flinn of Engineering Foundation that a set of *Transactions* as nearly complete as can be furnished by the Society, be forwarded free of charge to the University of Louvain, Belgium, was acceded to. These volumes will be forwarded without charge for carriage by the Smithsonian Institution.

"The membership of this Society in the Permanent International Association of Navigation Congress which permits the nomination by the Society of an 'Official Delegate', was continued.

"Consideration was had of several requests for exchange, together with other routine matters.

"Respectfully submitted,

"FRANCIS LEE STUART,

"Chairman.

On motion, duly seconded, this report was adopted and ordered filed.

## REPORTS OF COMMITTEE ON SPECIAL COMMITTEES.

Chairman Davis, of the Committee on Special Committees, reported on the three following subjects:

(a) Committee on Education:

"This Society formerly appointed a Committee on Technical Education, which reported and was discharged. Its work was valuable, and no need is seen for another committee to cover the same field.

"Developments of the past few years, however, have shown the need of extending and co-ordinating activities in the field of industrial education and training,

\* This amount stated to be \$1,115.42.

† See p. 448.



and this need has been recognized by the American Society of Mechanical Engineers by the appointment of a committee for this purpose. Engineering Foundation is also investigating the subject.

"We believe it would be wise to appoint a small committee with broad powers to consider the subject, and at its discretion to co-operate with similar committees of other Societies.

(Signed) "GEORGE H. PEGRAM,  
"A. P. DAVIS."

This report was discussed by Vice-President Cummings and Past-Presidents Pegram and Davis, and on motion of Mr. Davis, duly seconded, it was approved, and the President was authorized to appoint a committee of three.

(b) Valuation of Public Utilities:

"The Committee on Special Committees has considered the subject of the appointment of a Committee on Valuation of Public Utilities, which the Board referred to it, and has corresponded with members of the former Committee on the subject, and has to recommend that no committee on that subject be appointed at the present time. The former report is the product of a large amount of labor, and great skill, and no good purpose would be served by now going over the whole field anew.

(Signed) "GEORGE H. PEGRAM,  
"A. P. DAVIS."

On motion, duly seconded, this report was unanimously approved.

(c) Appropriation for Committee on Bearing Value of Soils for Foundations, etc.:

"The question of an appropriation for the expenses of the Committee on the Bearing Value of Soils has been considered by this Committee, and it recommends that the Board of Direction authorize an appropriation of \$2 000 for the year 1921, or so much thereof as may be necessary for the use of the said Committee, on the approval by the Committee on Special Committees of a budget to be submitted by the Chairman of the Committee on the Bearing Value of Soils.

(Signed) "GEORGE H. PEGRAM,  
"A. P. DAVIS."

Vice-President Cummings moved the acceptance of the report and the appropriation of the \$2 000 to the Committee. This motion was seconded by Director Hudson, and after discussion by Messrs. Henny, Talbot, Davis, Grunsky, and Anderson, as well as the Acting Secretary, was unanimously carried.

LETTER-BALLOTS FOR SECRETARY.

The President, as Chairman of the committee, consisting of the President and Past-Presidents who are members of the Board of Direction, which was appointed to investigate the available candidates for Secretary, reported that it had issued a letter-ballot for Secretary, which was canvassed by the Committee on April 2d, 1921, with the following result:

*For N. C. Grover:* Messrs. George G. Anderson, Baxter L. Brown, Willard Beahan, A. P. Davis, C. E. Grunsky, D. C. Henny, Clemens Herschel, John C. Hoyt, A. M. Hunt, Ira W. McConnell, A. N. Talbot, Edward E. Wall, and George S. Webster—13.

*For H. S. Crocker:* Messrs. George H. Clark, F. S. Curtis, Robert A. Cummings, C. C. Elwell, F. T. Darrow, Carleton Greene, John P. Hogan, C. W.

Hudson, J. S. Langthorn, John A. O'Connor, George H. Pegram, and Francis Lee Stuart—12.

*For William Greene Atwood:* Mr. O. E. Hovey—1.

The President further presented the ballots received by him, constituting the second letter-ballot issued by the Committee to be canvassed on this date.

Messrs. Cummings and Hoyt were appointed as Tellers to canvass these ballots, the result of which was reported as follows:

*For N. C. Grover:* Messrs. Willard Beahan, Baxter L. Brown, A. P. Davis, C. E. Grunsky, D. C. Henny, Clemens Herschel, O. E. Hovey, John C. Hoyt, I. W. McConnell, Edward E. Wall and George S. Webster—11.

*For H. S. Crocker:* Messrs. John W. Alvord, George H. Clark, Robert A. Cummings, Fayette S. Curtis, F. T. Darrow, C. C. Elwell, John P. Hogan, C. W. Hudson, J. S. Langthorn, J. A. O'Connor, George H. Pegram, and Francis Lee Stuart—12.

*For William Greene Atwood:* Mr. George G. Anderson—1.

*For E. T. Howson:* Mr. A. N. Talbot—1.

The President declared the ballot inconclusive, no one having received the 16 votes necessary to election.

On motion, duly seconded, the election of Secretary was made the order of business at 10 o'clock of the following day.

Later, an additional ballot was received from Vice-President A. M. Hunt for William Greene Atwood as Secretary, and the foregoing count was changed to show that two votes had been cast for Mr. Atwood.

A ballot received later from Director Carleton Greene for H. S. Crocker as Secretary was, by subsequent action, laid on the table.

#### REPRESENTATIVES ON LIBRARY BOARD.

The Acting Secretary reported the appointment by President Webster, in accordance with authority granted at the meeting of March 7th, 1921, of four representatives of the Society on the Library Board of the United Engineering Society, as follows:

C. J. Tilden.....	for 4-year term	(ending December 31st, 1924)
M. E. Cooley.....	3- " "	( " " " 1923)
Robert A. Cummings....	2- " "	( " " " 1922)
Francis Lee Stuart .....	1- " "	( " " " 1921)

The Acting Secretary reported for the information of the Board the payment by him to Mr. J. Parke Channing of the sum of \$2 750 in reimbursement for funds advanced for certain activities of Engineering Council, receipt of which has been duly acknowledged by Mr. Channing.

The Acting Secretary further reported the adoption of the following resolution by the Governing Board of the United Engineering Society at its meeting of March 24th, 1921:

"Whereas, By action of the Trustees of United Engineering Society at a meeting December 19th, 1919, it was determined that each Founder Society should have an annual credit of 4% on \$262 500, from February 1st, 1920, until further action by the Trustees of United Engineering Society, and

"Whereas, The rate of interest so fixed is now very low, and

"Whereas, Income to be derived from the Founder Societies for the use of space in the building for which no assessments have heretofore been levied, will permit the paying of a higher rate of interest; therefore, be it

"Resolved: That from and after April 1st, 1921, until further action of the Trustees of United Engineering Society, each Founder Society be paid interest at the rate of 4.8% per annum, on the sum of \$262 500 provided by it toward the cost of the property of United Engineering Society; that is, \$12 600 per annum."

The Acting Secretary explained that the foregoing action would result in an annual saving to the Society of \$550 as compared with assessments for the preceding year.

#### COMMITTEE ON MILITARY AFFAIRS PROPOSED.

The Acting Secretary reported the receipt of a letter from R. D. Coombs, M. Am. Soc. C. E., suggesting the desirability of the appointment of a committee "charged with the duty of reporting on, or continuously assisting toward, the proper relation of the engineer to the War Department, and with particular reference to the Officers Reserve Corps." The Acting Secretary further explained the desirability of a Military Committee in connection with the editing of the Honor Roll for its final publication in *Transactions*.

This matter was, on motion of Director Humphrey, seconded by Director Hudson, and carried, referred to the Committee on Special Committees for recommendation to the Board.

#### PLAN FOR TABLE OF CONSTANTS ENDORSED.

The Acting Secretary presented a letter of date of April 2d, 1921, from Vice-Chairman A. D. Flinn, of the Division of National Research Council, reciting the efforts of Council in the compilation and publication of a volume in English of a table of physical and chemical constants, and requesting the endorsement and moral support of the Society.

Director Humphrey moved the following, which was duly seconded and carried unanimously:

"Resolved: That the American Society of Civil Engineers endorses the compilation and publication of a volume of critical tables of physical and chemical constants and other data, in accordance with a plan formulated by the National Research Council on October 2d, 1919."

#### DELEGATES TO ENGINEERING CONFERENCE.

In accordance with the action of the Board of Direction at its session of March 7th, 1921, the President reported the appointment of Charles T. Main, M. Am. Soc. C. E., to represent the Society at the Engineering Conference to be held in London, England, on June 29th, 1921, and action was taken in regard to the appointment of Vice-President Cummings and Director Henny as additional representatives, with Mr. Main as Chairman of the delegation.

The delegates so appointed were instructed to present appropriate greetings of the Society to both the Institution of Civil Engineers and the Société des Ingénieurs Civils de France.

## COMMITTEES ON UNIVERSAL CODE OF ETHICS AND COMPENSATION.

The Acting Secretary reported for the information of the Board the appointment by the President of Vice-President Hunt and Director Elwell as a Committee to act with the Committee of the American Society of Mechanical Engineers in the preparation of a Universal Code of Ethics common to all engineers and architects; also, the appointment of Messrs. J. C. Hoyt, O. C. Merrill, and W. E. Rolfe, as a Committee on Compensation of Engineers. Subsequently, the latter Committee made the following report:

"THE PRESIDENT,

"APRIL 20th, 1921.

AMERICAN SOCIETY OF CIVIL ENGINEERS:

"SIR.—Your Committee appointed to make recommendations to the Board relative to proper action in regard to the report of Engineering Council's Committee on Classification and Compensation of Engineers dated December 15th, 1919,\* reports as follows:

"We have made a study of the report in question in connection with other reports on this subject. We find that the conclusions reached by Engineering Council's Committee agree in the main with those reached by others who have studied the question and we believe that their conclusions are generally applicable to all branches of Civil Engineering. We, therefore, recommend:

"(1) That the Board of Direction of the American Society of Civil Engineers endorse the classification presented by Engineering Council's Committee, as in its judgment generally applicable to all branches of engineering.

"(2) That it approve the proposed salary schedule, not as an inflexible standard, but as indicative of the proper salary relation between the several grades of the classification; as proposing minima for the several grades which under ordinary circumstances are the least that can be considered reasonable and just, and as providing sufficient range between minima and maxima for making adjustments to suit variations in living conditions, kind of work, and character of service, and for permitting adequate salary advances within the grades themselves.

"(3) That copy of these recommendations together with the classification and the salary schedules be transmitted to the membership of the Society, to the engineering press and to the American Engineering Council with the recommendation that the classification be adopted in connection with their several employment services.

(Signed) "O. C. MERRILL,  
"JOHN C. HOYT,  
"W. E. ROLFE."

Director Brown moved that the report be received, its recommendations be approved, and that the Committee be discharged. This motion was seconded by Director Anderson and unanimously carried.

The Secretary read a report from the Alfred Noble Memorial Committee.†

On motion of Director Humphrey, duly seconded and carried, this report was received and ordered reported to the Business Meeting of the Annual Convention on April 27th, 1921.

## DELEGATES AND REPRESENTATIVES.

The Acting Secretary reported that Messrs. William Easby, Jr., Benjamin Franklin, and John Meigs had been appointed by President Webster and had served as delegates of the Society to the Twenty-fifth Annual Meeting of the American Academy of Political and Social Science held in Philadelphia, Pa., on May 13th and 14th, 1921.

\* For this report see *Proceedings*, Am. Soc. C. E., January, 1920, p. 42.

† See p. 475.



A report from Robert Isham Randolph, M. Am. Soc. C. E., who had attended the National Construction Conference in Chicago, Ill., on March 2d and 3d, 1921, as a representative of this Society, was received and, on motion, duly seconded, ordered filed.

The Acting Secretary reported the acceptance by Past-President Chas. D. Marx of his reappointment as representative of the Society on the Washington Award Commission for the term from June 1st, 1921, to June 1st, 1923.

Action was taken in the reappointment of President George S. Webster as one of the representatives of this Society on the Division of Engineering of the National Research Council.

#### NEW YORK STATE LICENSE LAW.

The Acting Secretary presented a communication from William J. Wilgus, M. Am. Soc. C. E., of date of April 15th, 1921, in relation to action of the Legislature of the State of New York in the passage of a bill for the Licensing of Engineers, suggesting reconsideration of the provisions of the "Uniform Law" recommended by Engineering Council in 1920, and an effort to determine by secret ballot the sentiments of the members of the Society regarding the practicing of engineering in the State of New York by corporations and unrestricted partnerships composed in part of non-engineers. This communication was accompanied by a copy of a letter of date of April 14th, 1921, to the Governor of the State of New York requesting his veto of the bill to amend the existing Professional Engineers' License Law, signed by William J. Wilgus, *et al.*\*

The subject was discussed by Messrs. Davis, Crocker, Pegram, Humphrey, McConnell, and Talbot.

Director Hudson offered the following resolution:

*"Resolved:* That it is the sense of the Board of Direction of the American Society of Civil Engineers that the granting of licenses to practice Engineering and Surveying should be limited to qualified Professional Engineers and Surveyors and associations composed solely of qualified Professional Engineers and Surveyors, and be it

*"Further Resolved:* That a copy of this resolution be forwarded by the Secretary to the Hon. Nathan L. Miller, Governor of the State of New York at Albany."

This resolution was seconded by Past-President Pegram.

Discussion was continued by Messrs. Hovey, Humphrey, McConnell, Hoyt, Pegram, Anderson, Talbot, and Henny.

Director McConnell offered the following substitute motion:

"That the whole matter be referred to a Committee of five to be appointed by the Chair to report at a future meeting."

This motion was seconded by Treasurer Hovey.

The substitute motion was then discussed by Messrs. Grunsky, Humphrey, Hudson, McConnell, Davis, Wall, Hovey, and Henny, and on vote by show of hands was carried by 9 "ayes" to 7 "noes".

The President subsequently appointed Messrs. Richard L. Humphrey, Chairman, Willard Beahan, Baxter L. Brown, Anson Marston, and Francis Lee Stuart, to serve on this Committee.

\* Extracts of this letter are reprinted on p. 533.

The Board considered the resignation of Rudolph P. Miller, M. Am. Soc. C. E., as Chairman of the representatives of the Society on the Joint Committee on Concrete and Reinforced Concrete.

On motion of Director Grunsky, seconded by Director Hudson, Mr. Miller's resignation was accepted and the President was authorized to appoint a substitute.

The Acting Secretary presented communications from Arthur S. Tuttle, M. Am. Soc. C. E., of date of March 11th and April 8th, 1921, concerning the need of funds for defraying the cost of a bust of the late Capt. James B. Eads, F. Am. Soc. C. E., to be placed by the University of New York in its Hall of Fame.

On motion of Director Humphrey, seconded by Past-President Davis, the Acting Secretary was instructed to publish in *Proceedings* an invitation for voluntary subscriptions from the membership.

Action was taken in the appointment of Charles L. Pillsbury, M. Am. Soc. C. E., as Delegate, and F. C. Shenehon, M. Am. Soc. C. E., as Alternate, to the Inaugural Exercises for the installation of Lotus Delta Coffman as President of the University of Minnesota.

The President was authorized to appoint a committee of three to recommend to the Board the award of prizes for papers accepted and printed by the Society from the period of August, 1920, to May, 1921, inclusive.

The Acting Secretary presented a letter of date of February 26th, 1921, from J. H. Dodd, Assoc. M. Am. Soc. C. E., suggesting that applicants for Associate Membership be required to pass an examination before admission.

This matter was discussed by Messrs. Anderson, Hoyt, Humphrey, Cummings, and Wall, and Director Hoyt, moved:

"That the President be authorized to appoint a committee of three to formulate a plan for acting on applications for membership."

Vice-President Cummings seconded this motion, which was duly carried.

Action was taken in the matter of revising the regulations for the formation of Student Chapters to show a minimum requirement of twelve members in the initial organization.

#### ACTION OF LOCAL SECTIONS ON REVISED CONSTITUTION.

The Acting Secretary presented resolutions adopted by the Spokane, Illinois, and Louisiana Sections, approving the draft of the proposed Constitution and By-laws as recommended by the Committee on Referred Amendments, and Director Grunsky further reported that the San Francisco Section had also approved such draft.

The Acting Secretary further presented a protest from the New York Section against the change proposed by the Committee in Article VII, Section 1, restricting District No. 1 to the limits of New York City.

On motion of Past-President Davis, seconded by Treasurer Hovey, this communication was referred to the Committee on Referred Amendments.

Action was taken in approving the change of the name of the Southern California Section to Los Angeles Section.

Resolutions were presented from the Duluth Section requesting that the Board of Direction return with the least possible delay to former practice in the publica-

tion of *Proceedings*, which, on motion, duly seconded, were referred to the Publication Committee.

#### ACTION REGARDING DATES FOR LOCAL SECTIONS.

The Acting Secretary presented a request from the Cincinnati Section that the die for its letter-head be dated 1888, the date of its original organization, and stated that the Constitution of that Section was approved in 1920, but explained that the St. Louis and Cincinnati Associations of Members were in existence in 1888, although nothing appears in the Board records from June, 1888, to June, 1891, regarding them.

Director Humphrey moved that the Sections of the Society be considered as having their date of origin identical with the date of the approval of their Constitutions and By-laws by this Board, and that dies for their letter-heads be dated accordingly.

This motion was seconded by Director Henny and duly carried.

Action was taken in approving the Constitution of the proposed Kansas City Section.

Recess was taken at 6.45 P. M. until 9 A. M., April 26th, 1921.

**April 26th, 1921.**—The Board reconvened at 9.10 A. M., at the Rice Hotel, Houston, Tex.; President Webster in the chair; H. S. Crocker, Acting Secretary; and present, also, Messrs. Anderson, Beahan, Brown, Cummings, Darrow, Davis, Grunsky, Henny, Hovey, Hoyt, Hudson, Humphrey, McConnell, Pegram, Stuart, Talbot, and Wall.

#### FINAL REPORT OF JOINT CONFERENCE COMMITTEE.

Chairman Humphrey of the Joint Conference Committee presented a final report dated November 20th, 1920, which, on his motion, duly seconded and carried, was, after discussion, accepted. The accompanying accounts were approved and ordered paid, subject to audit by the Finance Committee.

The Secretary was ordered to have printed 1000 copies in pamphlet form to be retained in the files of the Society to provide for future demands.

#### NEW STUDENT CHAPTERS.

Approval was given to the establishment of the following Student Chapters:

The Cornell University Student Chapter,  
The California Institute of Technology Student Chapter,  
The University of Maine Student Chapter.

Approval was given to the formation of the following Student Chapters at such time as the initial dues shall have been paid:

The University of Illinois Student Chapter,  
The University of Minnesota Student Chapter,  
The Oregon State Agricultural College Student Chapter,  
The Syracuse University Student Chapter.

## FUTURE BOARD MEETINGS.

Action was taken in fixing the following dates for Board meetings during the current year: Regular Quarterly Meetings: April 28th, June 6th, and October 10th, 1921; Intermediate Meetings: July 11th, September 12th, and November 21st, 1921.

Director Humphrey moved that when the meeting adjourn, it adjourn until 7.30 P. M., Thursday, April 28th, 1921.

## NEW ACTING SECRETARY ELECTED.

At 10 A. M., the matter of the Secretaryship having been made a special order of business, the Acting Secretary withdrew.

Director Humphrey was elected Secretary *Pro Tempore*.

A ballot was taken for Secretary, resulting in 13 votes for Nathan C. Grover and 5 votes for H. S. Crocker.

The President announced that there was no election.

Director Grunsky then presented a letter from Mr. Grover requesting that if there is no election of Secretary at the meeting of the Board to be held in Houston on or about April 25th, 1921, that his name be withdrawn, and that he be no longer considered as available for the position.

Director Grunsky then moved that the Board proceed to the election of a new Acting Secretary to assume his duties on May 11th, 1921.

Director Henny placed in nomination for Acting Secretary Elbert M. Chandler, M. Am. Soc. C. E., and addressed the Board advocating his election. This nomination was seconded by Past-President Davis, who recited his knowledge of the candidate.

Director Hudson placed in nomination the name of Herbert S. Crocker.

The President appointed Messrs. McConnell and Hudson as Tellers to canvass the ballots. The tellers announced that Mr. Chandler had received 13 votes and Mr. Crocker 5, upon which the President announced that a majority having voted in favor of Mr. Chandler, he is therefore elected Acting Secretary to take office on May 11th, 1921, subject to his acceptance.

The Acting Secretary was recalled at 10.45 A. M.

## PUBLICATION OF BIOGRAPHICAL SKETCH OF NOMINEES FOR OFFICE.

Consideration was had of a letter from Vice-President Cummings dated April 7th, 1921, suggesting that ballots for officers of the Society should contain biographical records of the several candidates.

The subject was discussed by Messrs. Grunsky, Cummings, Davis, Humphrey, McConnell, Anderson, and Talbot, and tentative motion was offered by Vice-President Cummings who accepted an amendment suggested by Past-President Davis, the motion taking the final form:

"*Moved:* That there be published in the *Proceedings* of the Society issued immediately after the nominations of the several candidates for office a biographical sketch of each candidate including his professional record, such sketch to be prepared for publication by the candidate himself."

This motion was seconded by Director Hudson, and carried.



Director Humphrey moved that when the Board recess, that recess be taken at 12 o'clock, and that the Board reconvene at 2 P. M.

Vice-President Wall reintroduced the subject of dates of organization and approval of Constitutions of Sections of the Society, and moved that in the Year Book and *Proceedings* the description of Local Sections be changed to eliminate the word "organized" and date of organization, and to substitute therefor the words "Constitution approved by the Board" followed by appropriate date.

This motion was seconded by Past-President Davis and unanimously carried.

#### REPORT OF PUBLICATION COMMITTEE.

Acting Chairman Humphrey of the Publication Committee presented the following report:

"APRIL 13TH, 1921.

"TO THE BOARD OF DIRECTION

AMERICAN SOCIETY OF CIVIL ENGINEERS:

"Your Publication Committee has held three meetings since the last meeting of the Board, and reports the following matters:

"The Committee has carefully considered the advisability of the publication of a Professional Directory of Engineers (referred by the Board to your Committee in October, 1919, as a result of the resolution presented by Director Grunsky). All the Founder Societies circularized their Local Sections, and the results indicate that the sentiment is against the publication of such a directory. The consensus of opinion is that the cost of publication will be prohibitive, and that there is little demand from the membership in general. The American Society of Mechanical Engineers tabulated the replies from the Sections as follows:

	No. Local Sections.	Replies.	In Favor.	Against.
Am. Soc. C. E. ....	30	12*	1	9
Am. Inst. M. E. ....	22	5	0	5
Am. Soc. M. E. ....	43	10	0	10
Am. Inst. E. E. ....	40	9	0	9

\* Two Sections deferred action.

"In view of the action of our own Sections in the matter, and the present high cost of printing, your Committee concurs in the sentiment against the publication of such a directory at this time.

"Your Committee would like to have a decision by the Board as to whether it is permissible to publish as a discussion a description of a patented device.

"Your Committee reports unfavorably upon the request for the reprinting of the paper 'The Structural Design of Buildings' by C. C. Schneider, and would like the Board's judgment as to whether or not the reprinting of important papers of this character is desirable, even at a probable loss. In this particular case, the cost of reprinting would be as follows:

#### Specifications (Pages 400 to 508, inclusive).

	300 Copies.	500 Copies.	1 000 Copies.
On No. 64 Bible Paper .....	\$74.37	\$82.37	\$95.37
On Super Paper .....	77.87	88.37	106.37

#### Reprints of the Entire Paper.

On No. 64 Bible Paper.....	\$522.81	\$572.51	\$675.11
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"In accordance with instructions your Committee submits herewith samples of Junior cards, recommending that No. 1 be approved; this is to be a white card with rounded corners, engraved, printed with blue ink, with the year embossed in red in place of 'Expires—'.

"Your Committee has under consideration the matter of letter-heads for Student Chapters and Special Committees, and finds that the subject requires further careful study; it will make a report at the earliest possible moment.

"The Committee has under consideration the request of the New York Section that assistance be given in publishing the papers and discussions presented, and it is felt that this matter is so fundamental, and involves the principle of equitable treatment of all Sections, that your Committee deems it wise to refer it to the Board of Direction, with the request that they in turn refer it to the Committee on Technical Activities for report.

"The Committee recommends that the Preliminary List of Applications for Admission or Transfer to Membership be printed on the same paper as that used for the *Proceedings*, printing 50 copies on the same paper as now used for the Preliminary List, if necessary for use of the Board, thereby effecting a saving of upwards of \$1 000.

"The Publication Committee recommends that the *Proceedings* be restored to their old form, *i. e.*, by publishing papers and discussions therein, using a 4½ by 7½-in. type page, at an estimated annual increased expense of about \$6 500 over the cost of publishing the *Proceedings* in their present form.

"Respectfully submitted,

"A. M. HUNT,

"C. C. ELWELL,

"C. E. GRUNSKY,

"C. W. HUDSON,

"RICHARD L. HUMPHREY,

"Publication Committee."

Action was taken on the several items as follows:

(1) The recommendation against the compilation of a Professional Directory of Engineers was approved.

(2) Discussion developed that it was the sense of the Board that if a description of a patented device carries an undue amount of advertising, it shall not be published in the *Proceedings* and *Transactions*.

(3) Approval was given to the recommended form of membership card for Juniors.

(4) Action was taken in referring to the Committee on Technical Activities for consideration and recommendation the letter from the New York Section suggesting possibility of the publication by the Society of its papers and discussions in *Proceedings*.

(5) The recommendation that return be made to the publication of papers and discussions in *Proceedings* in the form suggested, was unanimously approved.

(6) It was decided that in the future, Preliminary Lists shall be printed on the same weight of paper used for *Proceedings*, with the page size as recommended by the Committee.

By action of the Board, the President was instructed to report to the Annual Convention the principal matters of interest to the members covered by action of the Board at this meeting.

## PROPOSED ACTION REGARDING STANDARD CONTRACTS.

The Acting Secretary presented the following correspondence transmitted to him by Director Langthorn:

"APRIL 23, 1921.

"TO THE BOARD OF DIRECTION,

AMERICAN SOCIETY OF CIVIL ENGINEERS:

"GENTLEMEN.—In forwarding the attached letter from Mr. H. Eltinge Breed, Chairman of our Committee of Highway Engineering, in which he suggests that the Society take up the matter of bringing out a general form of contract standard clauses, I wish to heartily endorse his proposition.

"Unfortunately being unable to present this in person at the Houston meeting, I take this opportunity of recommending that a standing committee on Contract Forms be appointed with a limit of \$1000 for expenses. The work of the Committee can be accomplished mainly by correspondence.

"While there seems to be the greatest need in highway work, on account of the magnitude of the programme, for standard contract clauses, the value to general public works and also for private work should not be lost sight of.

"I believe that Mr. Breed has presented a constructive idea which can be developed with profit to our members and the public.

"Respectfully,

"J. S. LANGTHORN."

Mr. Breed's letter, referred to by Mr. Langthorn, is as follows:

"APRIL 22, 1921.

"J. S. LANGTHORN, *Director*,

AMERICAN SOCIETY OF CIVIL ENGINEERS,

2 West 45th Street, New York City.

"MY DEAR MR. LANGTHORN.—From my experience in municipal, county, and village highway pavement work, there is great need for real information upon the general or standard form of contract with clauses for construction work. Most forms of contract have grown by accretion and are inadequate to the needs of the situation. Many of the demands in recent years have been met by clauses which have been added by attorneys who have had to protect the governing powers money with additional safeguards, due entirely to a wrong form of contract taken in the first instance by the engineer because it had been in use.

"Another need is due to the fact that our highway and paving programme is expanding so rapidly that many engineers who have not had full responsibility on projects have now found themselves in a position where it becomes incumbent upon them to provide a form of contract for construction work.

"If the Society could take up this topic and develop it so as to bring out a general form of contract with standard clauses it would, in my opinion, do a great work for men who are confronted with this new responsibility.

"Should this idea receive attention by the Society, I think it would help the general development of the subject if the committee that was appointed would confer with the organizations of the Highway Officials and such other engineers as are in a position to bring out the engineering side of the question and also with some organizations of contractors such as the Associated General Contractors of America.

"Hoping that this idea can be given due consideration and assuring you of my willingness to co-operate in any way, I am

"Very truly yours,

"H. ELTINGE BREED,

*Chairman, Committee of Highway Engineering,  
American Society of Civil Engineers."*

After discussion, the foregoing correspondence was, on motion of Director Humphrey, seconded by Past-President Pegram, referred to the Committee on Special Committees for its recommendation.

At 12 o'clock noon, recess was taken for luncheon.

The Board reconvened at 2.10 P. M., considered reinstatements and resignations, and recessed at 3.10 P. M. to meet as Membership Committee.

The Board reconvened at 10.45 P. M., at the conclusion of the meeting of the Membership Committee.

The report of the Membership Committee was presented.

On motion, duly seconded, the recommendations of this report, which were not read, were adopted as the action of the Board.\*

Adjourned at 10.46 P. M., to meet at 7.30 P. M., April 28th, 1921.

**April 28th, 1921.**—The Board met at 7.40 P. M., at the Rice Hotel, Houston, Tex., at the time of the Annual Convention, as required by the Constitution; President Webster in the chair; H. S. Crocker, Acting Secretary; and present, also, Messrs. Anderson, Brown, Darrow, Davis, Grunsky, Henny, Hovey, Hoyt, Humphrey, Hudson, and McConnell.

On motion of Past-President Davis, duly seconded, unanimous action was taken in allowing mileage to the members of the Committee on Referred Amendments covering the meeting at Houston, Tex., on April 25th to April 27th, inclusive, 1921.

President Webster announced that he had received a telegram from Mr. Elbert M. Chandler accepting the position of Acting Secretary.

Director Grunsky moved "a vote of thanks and appreciation to Herbert S. Crocker for having, after his discharge from service in the Army, placed his services at the disposal of the Society as Acting Secretary."

This motion was seconded by Director Humphrey and unanimously carried.

Director Henny moved a vote of thanks to the Committee of the Board of Direction on arrangements for the Annual Convention for its efficient service in arranging the details necessary for the conduct of the Annual Convention.

This motion was seconded by Past-President Davis and unanimously carried.

Director Anderson addressed the Board on the subject of the desirability of the creation of a fund for the relief of members in financial distress due to age or unemployment.

The matter was further discussed by Messrs. Brown, Henny, Hoyt, and Humphrey, but no action was taken.

Adjourned, 8.30 P. M., to meet at 10 A. M., June 6th, 1921, at Society Headquarters, in New York City.

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\* See p. 448.

**FIFTY-FIRST ANNUAL CONVENTION, HELD IN  
HOUSTON, TEX., APRIL 27th-30th, 1921**

**FIRST SESSION**

**Wednesday, April 27th, 1921.**—The business meeting of the Annual Convention was called to order in the Rice Hotel, Houston, Tex., at 10 A. M.; J. H. Brillhart, M. Am. Soc. C. E., President of the Texas Section, presiding; Herbert S. Crocker, Acting Secretary; and present, also, 296 members and guests.

**THE CHAIRMAN.**—Ladies and gentlemen: It is my pleasure and privilege to open this, the Fifty-first Annual Convention of the American Society of Civil Engineers. In behalf of the Texas Section of the Society, it is my pleasure to welcome you to the State of Texas. I hope that each and every one of you will have an enjoyable and beneficial visit to our city.

The State of Texas is very fortunate—it has an Executive who is interested in the progress of engineering. He is exceptionally interested in the conservation of water power and in the building of good roads. It is now my pleasure and privilege to introduce to this audience Governor Pat M. Neff, of the State of Texas.

**ADDRESS OF WELCOME.**

**GOVERNOR NEFF.**—Mr. Chairman, ladies and gentlemen: About three score and ten years ago the American Society of Civil Engineers was organized. During that brief span of life its fame has traveled around the world, and to-day ten thousand engineers are proud to have their names inscribed on its membership rolls. This is the first time in nearly half a century that this distinguished organization has held its Annual Convention beneath Southern skies. We want you, therefore, on this, your initial visit to Texas, to receive in this highly typical Southern city, not only a State-wide welcome, but such a welcome as only Southern hospitality knows how to extend in honoring guests within her gates. A hundred thousand glorious achievements in both peace and war have acclaimed your coming and your visit, we trust, with a thousand unknown recollections, sweet as the dreams of the morning, will hang forever in the halls of your memory.

We welcome your organization to Texas as a promoter far out in the unknown fields of science. We welcome you as the highest intellectual expression in the world of man power and natural resources; and we welcome you as the guiding genius in the upbuilding forces of civilization.

The Civil Engineer is the wonder-maker of the world—what others dream, he accomplishes; what others visualize, he brings to realization; what others imagine, he makes real; what others put into words, he works into deeds. Others stand by merely to admire. You attend, to do man's bidding. You are the wizards of work, and you aid in subduing the elements of earth and sea and air. From the building of the Pyramids to the digging of the Panama Canal, there has not been an obstacle in all the achievements of peace that you have not been able to overcome. From the changing of an ancient river bed that turned in a night the tide of battle, to the building of the breastworks that immortalized the fields of France, there has not been a factor amid the marshalled conflict of the world that involved the life or death of a nation, that you have not been able to solve.



The Civil Engineer is a man of vast and varied accomplishments in the wide field of human service. He makes war maps on the accuracy of which hangs the future of the life of his country. He drains the swamps; he destroys the abiding places of disease; he lays out cities; he constructs irrigation systems; he makes the desert blossom as the rose; he tunnels the mountains; he bridges the streams as he builds railroads and highways and waterways. He lays the pulsing cables and stretches the vibrating wires under the deep sea and through the beauteous air, and makes neighbors of all the sons of men and turns this busy, whirling world into a whispering gallery. He plans and builds; he digs and delves and dives, and this inhabited earth is resonant with the music of his works.

Gentlemen of genius, pioneers of progress, promoters of the truth, we welcome you to Texas. Our natural fields and our natural resources, undiscovered, untold and untellable, to these we extend to you glad greetings. Our schools of mathematics, of physics, of geology, of chemistry, of hydrology, of all the branches of your profession or learning, of all of which you are a part, have been honored, and they are encouraged and strengthened by your presence.

Our people, cultured and accomplished, with a welcome beyond the lifts of language to speak, hold out to you this bright, beautiful morning happy, hospitable hands of friendship and fraternity. All Texas, this morning, truly salutes the American Society of Civil Engineers and bids you be at home among us.

THE CHAIRMAN.—The Governor has just told us what the State of Texas has. Our City of Houston is proud to-day that, for the first time in her existence, she has as a Mayor a technical man. It is my pleasure and privilege to introduce this morning Mayor Holcombe, of the City of Houston.

MAYOR HOLCOMBE.—Ladies and gentlemen: It is my pleasure, as the Mayor of the City of Houston, to welcome the members of the American Society of Civil Engineers, and you ladies, to our city. It is needless to say that Houston is conscious of the honor bestowed on this city by your coming as our guests.

While I am not a graduate of any kind, yet in my architectural and construction business I have come in close contact with many members of the Engineering Profession, and in that contact I have borne the very highest regard for the profession as such. The City of Houston has been particularly fortunate in having men of the very highest rank as heads of the Engineering Department, and some of their work will stand out as monuments to those men, and to the Engineering Profession. We are on the verge of another era of progressiveness that will tax the very best there is in that Profession. Our location and the topography of this section of the country is such that it calls for the very best engineering. Some of these difficult problems have been solved but many of them remain to be solved. It shall be the purpose of the administration which I am representing to-day, to do all in its power to make your stay in our city both useful and pleasant. We hope that you will profit viewing our many engineering feats in this vicinity.

If you do not see what you want, ask for it, and I think that it will be produced. Mind you, however, that this has no reference to any liquids, or anything that would violate the Eighteenth Amendment to the Federal Constitution. (Laughter.) Barring that, however, my statement takes in everything. Make yourselves perfectly at home. We feel highly honored to have you with us. The

keys of the City are turned over to you, ladies and gentlemen. The City is yours for any time that you remain with us.

THE CHAIRMAN.—We have heard from the Governor and from the Mayor. They have welcomed us. It is now my pleasure and privilege to introduce one of the Engineers, who will tell us about the Engineer's welcome—Mr. E. E. Sands, of Houston, Tex., a member of the Local Committee of Arrangements.

E. E. SANDS, M. AM. SOC. C. E.—Mr. President, ladies and gentlemen of the Convention: As I understand it, this paper of mine is to be turned over to the Secretary after I get through, and I will be compelled to read it so that I will say what will be recorded that I have said. (Laughter.)

#### ENGINEERING ACTIVITIES OF THE HOUSTON DISTRICT.

The Local Committee is so appreciative of the honor conferred on the City of Houston, the State of Texas, and the local membership by the holding of the Annual Convention here that if the desire of the Committee had been the controlling factor this particular part of the programme would have been omitted and some feature substituted that would have furnished entertainment or instruction. However, the Acting Secretary of the Society requested that some local member present a paper on the engineering activities in this locality.

It is usual for the writer of such a paper to impart the information that some one else could have done the job much better, and even at the risk of being accused of the lack of originality, it is necessary that such a statement be made at this time. There was no man as well qualified for the job as Col. E. B. Cushing, Chairman of the Local Committee—a man who has been identified with the largest enterprises of the State for a third of a century—but he, as Chairman of the Committee, decreed otherwise; and from the first, it has been the law that every member of the Committee perform every task assigned without fault-finding or excuses.

The territory now embraced in the State of Texas has owed allegiance, at various times, to the flags of France, Spain, Mexico, the Republic of Texas, the Confederate States, and last, and for all time to come, to the United States of America. The history of Texas is of more than usual interest, but the subject assigned and the desire to be brief precludes any possibility of such a narrative. The fact that for nearly 200 years Texas was almost constantly involved in war left its natural resources undeveloped until the present generation found time to begin that task, which naturally, in a large measure, falls to the lot of the engineer. How well he is accomplishing this task you will know after you have seen more of his work, and it is hoped that you may find some of the results of his endeavors to be of interest.

Such local work as is monumental in character can be put into one or two classes: First, the transportation of the products of the lands, forests, and mines; second, the production and handling, on a large scale, of those commodities on which the prosperity of the State depends, namely, cattle, cotton, lumber, sulphur, oil, and other minerals. A third line of endeavor, but exhibited on a much smaller scale, is that of providing adequate water supply, public utilities, storm and sanitary sewers, and other work of a municipal character, which forms the very foundation on which the health and prosperity of a city depends and without which those aspirations of its citizens to own and surround themselves with beautiful homes, parks, libraries, and institutions of learning and culture could never be realized.

This paper will present, as briefly as possible, the work of the engineer as exemplified in Southeast Texas, of which Houston is the metropolis and commercial center. The classification previously outlined will be followed, and transportation will be considered first.

## FACILITIES FOR TRANSPORTATION.

A glance at the map of Texas reveals a vast area composed of grazing lands, rolling prairies, timber lands, river valleys, and coastal plains. The natural outlet by which the products of this territory can be sent to the markets of the world is through some harbor on the Gulf of Mexico. The construction and maintenance of a deep-water harbor on the Texas coast are matters of no small endeavor, and the Federal Government has wisely selected Galveston Harbor as the principal one, and has expended enormous funds on this harbor, with its channels leading to the Ports of Galveston, Texas City, Bolivar, and Houston.

Of equal importance with the development of waterways and harbors has been the construction of railroads across the great undeveloped areas of swamps, mountains, forests, and plains. To appreciate the extent of this Texas territory, it is only necessary to spread out a map of the United States and use a pair of dividers. Imagine the State of Texas cut out and swung about with certain points as pivots: With El Paso as the pivot, Houston and Beaumont will land in the Pacific Ocean west of San Diego, Cal.; use Beaumont as the pivot, and El Paso will swing into the Atlantic east of Jacksonville, Fla. The man living in Texarkana, Tex., is nearer Chicago, Ill., in both time and distance, than he is to El Paso. By this crude method, the magnitude of the transportation problems of providing rail connections to the Gulf of Mexico may be realized. Then examine the coast line of the Gulf in the vicinity of Galveston Harbor and you will see that all this system of rail transportation must pass through Houston, and you get the slogan of the Houston Chamber of Commerce, "Where Seventeen Railroads Meet the Sea."

The entire coast line of Texas is paralleled by low-lying, shifting sand-bars, and it is only at the mouths of the principal rivers that this sand-bar is broken by channels of moderate depth. Galveston Island, on which the City of Galveston is located, is a part of this system of outlying sand-bars. The entrance channel to Galveston Harbor, with an original depth of 9 ft., was obstructed by two sand-bars. At an expenditure of approximately \$12 000 000 and the construction of two rubble stone jetties, combined with dredging and other miscellaneous work, there is maintained, at the present time, a channel 6 miles in length, with a minimum width of 250 ft. and a controlling depth of 33½ feet. The final project will provide a channel 35 ft. deep and 800 ft. wide. The two jetties are 5 and 7 miles long, respectively, with crests 5 ft. above mean low tide, and the outer ends are 7 000 ft. apart.

At Galveston Harbor, there are no terminal facilities, but there are dredged channels leading to Galveston, Texas City, Port Bolivar, and Houston. The commerce through Galveston Harbor totals from 4 000 000 to 6 000 000 tons per year. The terminals on the Galveston Channel are capable of accommodating 63 averaged-sized ocean-going vessels at one time. There are 2½ miles of wharves, wooden piers, and slips, and among the interesting features are two-story concrete pier sheds, a concrete grain elevator, a 10 000-ton floating dry dock, and a marine railroad.

At the Texas City terminals are two large piers with a very complete system of warehouses, a grain elevator, cotton compresses, and extensive facilities for the handling of oil. At Port Bolivar, there is one large pier and a transfer apron for transferring trains by ferry to Galveston Island.

## HOUSTON SHIP CHANNEL.

The Houston Ship Channel project was first authorized by Congress in 1872, and approximately \$1 000 000 was expended for construction and maintenance prior to 1898. Between 1898 and 1919, an additional expenditure of \$5 400 000 was made, \$1 400 000 of which was contributed by the Harris County Navigation District, which comprises the City of Houston and other territory in Harris County bordering the channel. With these funds, the channel was deepened to

25 ft., with a minimum bottom width of 100 ft. The enlarging of the channel to a depth of 30 ft. and increasing its bottom width is estimated to cost \$3 850 000, of which the Harris County Navigation District has contributed an additional \$1 365 000.

Deep-water navigation ends at the Turning Basin, which is 5 miles east of the business center of the City of Houston. This Turning Basin is connected with the heart of the city by a channel 8 ft. deep and 80 ft. wide. At the Turning Basin, the City of Houston has developed 3 626 ft. of water-front, with concrete and creosoted pile wharves, and has constructed transfer sheds, cotton sheds, and a large reinforced concrete warehouse, several miles of railroad, and other facilities. The result of all this development is threefold: First, Houston, although located 50 miles inland, now enjoys the same freight rates as seaport towns; second, a large coastwise and foreign shipping business has been developed; and third, many large industries requiring both rail and water transportation have been located on the channel, and it is believed that many others will take advantage of such an unusual opportunity.

The function of a large number of the wharves at Galveston and Houston is the transfer of freight from car to ship or from ship to car without storage. Much of the traffic is coastwise, and in normal times coastwise vessels are provided with side ports; consequently, the wharves are equipped with inclined ramps, with mechanical means of dragging hand trucks up these ramps. This means of handling general miscellaneous cargo has been found to be very economical. The visitor will miss the cargo hoists and cranes found at most modern ports, but when he studies costs he will find that the local cost of transferring from ship to railway car is less than the usual cost of transferring from ship to temporary storage in the pier shed.

#### THE GALVESTON CAUSEWAY.

The location of the principal port in Texas on an island two miles from the mainland necessitated some means of communication between the island and the mainland, and many years ago the first railway trestle was built connecting Virginia Point with Galveston Island. In 1900, there were two railway trestles and one highway bridge, all three of which were destroyed by the tropical hurricane which occurred in September of that year. In spite of the fact that a large mileage of the railroads on the mainland in the vicinity of the Causeway was destroyed at the same time, traffic was resumed over a temporary trestle within two weeks, and plans were begun for the construction of a permanent Causeway to be occupied jointly by the railroads and a public highway.

This Causeway was built during 1909, 1910, and 1911, at a cost of about \$1 700 000 and carried two railway tracks, one interurban, and one highway. The structure consisted of twenty-eight arches of 70 ft. span, one steel lift span, 109 ft. long, and the remainder, a total of more than 10 000 ft., was an earthen fill protected by blankets of concrete slabs. In August, 1915, this Causeway was partly destroyed, but 2 500 ft. of the fill section, all the arch section, and the lift bridge remained intact.

Temporary trestles were again built to replace the damaged section and plans prepared for replacing the part destroyed with a permanent structure consisting of 4 550 ft. of concrete arches and other miscellaneous work. This work of reconstruction was greatly delayed on account of war conditions and is now being completed at a cost of approximately \$2 500 000.

The conditions which this Causeway are required to withstand can be appreciated when one realizes that the storm of 1915 was accompanied by recorded wind velocities of more than 100 miles per hour, that there was a rise in the water surface of 16 ft., and that 8 000-ton vessels were blown inland and left high and dry  $\frac{1}{2}$  mile from the beach.

The members attending the Convention who are identified with transportation, will find much of interest in the City of Houston. The passenger and freight



station of the Houston Belt and Terminal Railway, the shops of the Southern Pacific, the creosoting plant, classification yards, etc., are all worthy of attention. Some idea of the magnitude of the Houston terminals of the Southern Pacific System may be realized from the following data: These terminals consist of 204 miles of track and utilize the services of 20 switch engines. The machine shops, car-repair shops, planing mills, boiler shops, blacksmith shop, power-house, and other buildings require the services of more than 2 000 men, and a part of the annual output consists of the repair of 36 000 freight cars, 360 passenger cars, and 900 locomotives. A desire to be brief precludes any additional discussion of transportation facilities.

#### INDUSTRIAL DEVELOPMENT.

The large industrial development of the Houston District naturally has to do with the raw products of Texas, and, more especially, the Gulf Coast. Texas produces 25% of the world's cotton. To reach the seaport, most of this cotton passes through Houston. Consequently, there are 70 firms in Houston who handle cotton, there are 8 compresses, and approximately 2 000 000 bales are handled in this city annually.

Of the numerous cotton plants in the city, that of the Houston Compress Company is the largest and most interesting from the standpoint of the engineer. This plant covers 50 acres, has a storage capacity of 100 000 bales, and is provided with two high density presses, an automatic conveying system, and electric-driven car loaders. The entire plant is built of reinforced concrete and is equipped with an automatic sprinkler system and every known device to secure minimum insurance rates. This is not the season for the compressing of cotton, but the owners have been so generous as to volunteer to start up one of the presses and have the entire plant in operation at the time the members attending the Convention visit that point on the regularly scheduled inspection tour.

In the city, there are several plants where various commercial products are manufactured from cotton-seed, and some of the operations—especially that of converting cotton oil into an edible product—are of interest to both the chemist and the engineer.

The Gulf Coast oil fields in the immediate vicinity of Houston produce approximately 100 000 bbl. of oil per day. This local production is augmented by pipe lines from the North Texas and Oklahoma fields, and large refineries are located on navigable water at Port Arthur, Beaumont, and Houston. At the latter point, the refineries are located on the Houston Ship Channel; and if sufficiently interested, members can arrange to visit the large, modern refinery of the Humble Oil and Refining Company with its extensive housing facilities, or that of the Galena-Signal Oil Company which specializes in the manufacture of high grade lubricants.

The large refinery of the Texas Company, at Port Arthur, has several unusual features, one of which is a complete mechanical equipment for the transfer of package goods from the warehouses to the ship's hold. The packages are placed on conveyors in the warehouses and enter the ship through spiral chutes swung from large cranes. It is probably the only port equipment on the Gulf Coast capable of handling package goods from warehouses located a considerable distance from the ship's side into the hold of the ship entirely by mechanical means.

The Texas Portland Cement Company's plant is located on the Ship Channel seven miles from the business district of the city. The plant has a capacity of 2 000 bbl. of Portland cement per day. The wet process is used. The raw materials available for the manufacture of cement are oyster shells, used for the lime constituent, and high silicious clay for the clay constituent. The oyster shells are hydraulically dredged at Red Fish Reef, in Galveston Bay, and delivered in barges to the plant wharf. The clay is secured from a clay pit at Pasadena, approximately three miles distant, and delivered to the plant in railroad cars. The unloading of the shells is done by means of a monorail crane which delivers them to a receiving hopper, and by means of a belt conveyor, they are taken to a pit, and by



a second monorail crane delivered to the raw mill or to the shell storage. The clay is unloaded with a locomotive crane and discharged into a wash mill, and, after being crushed, is stored in the form of slurry. The finished slurry is ground to a fineness of 92% through a 200-mesh sieve. The material is then burned, fuel oil being used for that purpose. The clinker is then cooled and ground and the cement stored and handled in the usual manner.

#### POST-CONVENTION TRIP.

A Post-Convention trip has been planned to two industries which are of more than usual interest.

Sulphur was discovered at Freeport, Tex., in 1901, while a rig was drilling for oil. The sulphur occurs in a bed of gypsum about 1000 ft. below the ground surface. Wells are drilled into this formation, and the sulphur is melted by water which has been heated to 335° Fahr. and is injected into the formation. The water runs off into cavities and a pool of sulphur forms at the base of the well. This is pumped to the surface and solidifies into blocks which are of 99½% purity. The plant, which is practically closed down at this time, due to market conditions, consumes, when running, 4000 bbl. of oil per day, to operate its boiler plant of 36 000 h. p. The quantity of water pumped into the ground daily is approximately 9 000 000 gal. The sulphur mines of Texas and Louisiana produce 98% of the world's supply of crude sulphur.

The Sugarland Industries consists of a small industrial city located in the center of a tract of 14 000 acres of the rich bottom-lands of the Brazos River. This river overflows periodically, leaving deposits of silt; with the result that these lands have great fertility. Levees are provided to prevent overflow, a drainage system has been constructed to carry off the surplus water during periods of excessive rainfall, and an irrigation system is being planned to take care of periods of drouth. The industrial city is provided with all public utilities and housing facilities for the company's employees. The industries include a sugar-mill, sugar refinery, sulphuric acid plant, vinegar plant, feed mill, cotton gin, and mattress factory, all operated from a modern power plant.

The municipal activities of the City of Houston involve few engineering features of special interest. The ambition of its more progressive citizens to have the city completely paved and well drained, to beautify and improve its parks, provide more playgrounds, and accomplish that multitude of activities to which all modern cities aspire, has been delayed, to a certain extent, on account of some rather unusual financial burdens which the city has had to bear. The development of the port and the local contribution to the dredging of the Ship Channel have required a large outlay of funds. The rapid growth of the city during the past few years has caused an expansion of its area with which the carrying out of an improvement programme has only partly kept pace.

#### DRAINAGE AND WATER SUPPLY.

The one feature that has been particularly expensive and will continue to require a considerable amount of money is storm-water drainage. With the exception of small areas along its watercourses, the greater part of the city is located on a plane lying about 50 ft. above sea level and with a fall that is almost negligible. The rainfall at times is excessive; months with 12 in. of rainfall are not uncommon, and a fall of more than 6 in. in 24 hours is experienced at frequent intervals. This has necessitated the construction of many miles of storm sewers, many of which are 10 ft. and more in diameter, and frequently from 20 to 40 ft. deep. The great cost of this work, which must precede street paving, has constituted an unusual financial burden.

The city is fortunate in having an artesian supply of first-class water. There are several water-bearing strata under all parts of the city, and it is only necessary to drill from 350 to 1300 ft. (depending on the stratum to be used) to get an

abundant supply at any point. This has saved the city the expense of constructing large mains from one central plant, and the policy has been to construct auxiliary plants in any part of the city where the supply has required augmentation.

The most modern of these plants is that known as the South Side Plant, located along the northern edge of Hermann Park. At this plant, there are four wells of varying depths. The pump pits are 24 in. in diameter, about 50 ft. in depth, and below that depth the casing is from 10 to 15 in. in diameter. At the bottom of the 24-in. pits, there are deep well centrifugal pumps which raise the water to the surface and deliver it into a round, concrete settling tank, the function of which is to remove any sand that may be pumped from the wells. This tank has a conical-shaped bottom, and the water is delivered to the tank in such a manner that a whirling motion is maintained within the tank, causing the sand to accumulate at the center, and the clear water is removed from the outer edge. Although the quantity of sand removed is very small, still the simplicity of this method of removal warranted the small expense involved to accomplish that purpose.

The wells at this plant are constructed in a manner that is new in this locality. All the water-bearing strata are composed of very fine sand, and the old method was to use a wire-wound-strainer with openings of a few hundredths of an inch. Experience has demonstrated that this type of strainer soon is partly, and finally completely, closed by formations of lime. When the South Side wells were drilled, an endeavor was made to construct long-lived wells that would give a large quantity of water. Consequently, strainers were used having openings of approximately  $\frac{1}{8}$  in. After the strainer was set and while the well was being pumped and large quantities of sand removed, several cars of roofing gravel was introduced around the outside of the strainer. The placing of this roofing gravel around a strainer, located from 900 to 1 300 ft. below the surface of the ground, was an interesting problem, but the two years that the plant has been in operation indicates that it has been entirely successful. Single wells of this type will yield 3 000 000 gal. or more per day.

#### SEWAGE DISPOSAL.

The principal watercourse through the city is known as Buffalo Bayou. This Bayou has a small drainage area and during periods of slight rainfall there is no current other than that produced by the tides. Formerly, many sanitary sewers discharged into this watercourse, and about five years ago the city undertook the problem of removing all sewage from this stream and the building of disposal plants. The topography of the city requires the pumping of all sanitary sewage; consequently, operating head was an important factor in the design of the disposal plants. The problem which confronted the designers was that of constructing a plant that would operate with the least possible head, produce a stable effluent, and remove the maximum quantity of suspended matter.

Although the activated sludge method was in the experimental stage at that time, an investigation carried on at Houston convinced the City Administration that it was the proper method to use. It was found possible to build such plants on small areas within the city limits; the process gave an effluent with a high degree of stability; there was a removal of at least 95%, and at times 99%, of suspended solids, and those solids that were not removed had a very small oxygen requirement. No endeavor was ever made to get a high degree of nitrification. Clarification and stability were the two requisites, and both were accomplished. The operating cost is higher than that of many other types of plant, but the combined cost, consisting of operating cost, interest on investment, repairs and depreciation, is less than that of other methods which give comparable results. Two plants were built—one with a capacity of 5 000 000 gal. per day and the other of 10 000 000 gal. per day. Experience has demonstrated that slight modifications in these plants will greatly increase their capacity and efficiency, without any large expenditure or the rebuilding of any part of the plants.

The problem of commercially dewatering the sludge and converting it into a commercial fertilizer has not been completely solved, but it has been demonstrated that the dewatering of the sludge by presses and dryers is not a factor on which the success of an activated sludge plant depends. The separating of the sludge from the supernatant liquor is a simple matter, and the pumping of this sludge through a small pipe to outlying territory where it can be dried on sandy soil or digested in lagoons is entirely feasible. One of the results of the several years' experience with the Houston plant is that the lagooning of large quantities of activated sludge does not create a nuisance.

The two principal sewage pumping plants in the city have a capacity of 18 000 000 and 7 000 000 gal. per day, respectively. These plants have no unusual features; they are modern in every respect, well kept, and economically operated.

Some of my local colleagues may feel that many important features of interest to the engineer have been overlooked or neglected, but such a paper must end before it becomes too tiresome. We who are striving in our small way to help in the development of this community have a natural pride in its energy, accomplishments, and possibilities, and it may have been proper to select a comparatively recent recruit to the local membership to invite your attention to the work of others.

The engineer has had a leading role in the material development of this city and State. I am sure that his place will be equally prominent in that other line of endeavor in which the citizens of Houston are now so earnestly engaged. If you could talk to each individual member of the Profession, you would find that he is vitally interested in the completion of our park and boulevard system, in the growth of that wonderful institution of higher education, the William M. Rice Institute, in the building of a suitable hall for the fine arts, and in all its other activities that will make Houston known as a center of learning and culture. As I see it, the engineer's task is not finished when he helps to create wealth by the planning and building of manufacturing and transportation facilities, but his work must continue until that wealth is diverted into those channels that will make each succeeding generation stronger, happier, better educated, and more manly than the last.

**THE CHAIRMAN.**—We will now hear from the President of the American Society of Civil Engineers, who will respond to the addresses which we have just heard. It is my pleasure to introduce President George S. Webster, of Philadelphia, Pa.

**THE PRESIDENT.**—Governor Neff, Mr. Mayor, ladies and gentlemen: It is my privilege, as President of the American Society of Civil Engineers, to thank your Excellency, on behalf of the members, for the splendid address of welcome which you delivered to us, and to express to you our high appreciation of the tribute which you paid to the Engineering Profession for its activities both in time of peace and in time of war. You have a large State and great resources, many of which have not yet been explored. You have railroad extensions to build, highways to construct, and other great public improvements to make, and in the carrying out of all this work the Engineering Profession will, I have no doubt, continue to co-operate and give its best skill and training to accomplish results which will be economical and to the best interests of the people.

Mr. Mayor, we appreciate your address of welcome. We are glad to receive the freedom of your city. We have looked forward with pleasure to coming here. The fame of this progressive city has spread throughout the entire North, and when we arrived here we were not disappointed, your wide streets, modern buildings, and tree-lined avenues in the residential sections, are most attractive. We

look forward with great pleasure to our stay in Houston, and we appreciate the opportunity which we will have to visit the many industries, public improvements, and educational institutions for which your city is noted.

It is the custom of the American Society of Civil Engineers to hold an Annual Convention and to visit the different sections of the country. In this way we keep in touch with the important works that are being accomplished by our members, and come to an understanding of their viewpoint. We have listened with great interest to the paper which was presented by Mr. Sands describing the public works and industrial developments in and about this city, and we look forward with great pleasure to the opportunity which we will have to inspect them during the next three days.

I wish to assure you all that our members keenly appreciate the hospitality which you are extending to us. It is such as the people of the South only know how to give, and at the close of our meeting to-day we confidently expect to have a delightful time enjoying the entertainments which you have provided for us.

THE CHAIRMAN.—Col. Cushing, Chairman of the Local Committee, will now make the announcement for the Local Committee. Col. Cushing has been responsible for the success of this meeting; he has a happy faculty of telling us to do something, without actually drafting us, and yet keeping us moving at a lively pace. I have the honor of introducing Col. Cushing.

(Col. Cushing was not in the room.)

It is just like the Colonel; he is in the habit of running off when something is to be said. (Laughter.) We will get him later.

ARTHUR P. DAVIS, PAST-PRESIDENT, AM. SOC. C. E.—Mr. President: In view of the magnificent hospitality with which this Convention has been received by the State of Texas and by the City of Houston, I move that the American Society of Civil Engineers, in convention assembled, extend a hearty invitation to all of the citizens of this vicinity, and especially engineers who may be interested in its proceedings, to attend all of its meetings.

A MEMBER.—I second the motion.

THE CHAIRMAN.—You have heard the motion, which has been duly seconded. Any remarks on the motion? If not, all in favor please signify the same by a rising vote.

(The motion was passed unanimously.)

Here comes Col. Cushing. (Applause and laughter.)

E. B. CUSHING, M. AM. SOC. C. E.—Gentlemen of the Convention: I am glad to see you here, but so far as making any address is concerned, there are two reasons why I will not do that; the first reason is, I cannot, and the second reason is, I am very hoarse.

First on the programme as planned I was to make some announcement on the part of the Local Committee, or rather, the first thing was to introduce our distinguished guests, and I put that up to Mr. Brillhart, and the next thing was to make some announcements, and we have omitted all the announcements, and so all I can say to you is that we are very glad to see you here and hope that you will have a "bully" good time.

THE CHAIRMAN.—The Constitution provides that the President of the Society, in Annual Convention, shall deliver the address of the occasion. It is now my



pleasure to present again President Webster, and he will deliver the Annual Address.

(President Webster presented the Annual Address\*)

THE CHAIRMAN.—Gentlemen, it is now my privilege to turn this meeting over to the President of your Society, Mr. Webster, who will take charge of the meeting henceforth.

(President Webster here took the chair and presided.)

THE PRESIDENT.—Gentlemen, the Secretary will now make several announcements.

#### REPORT OF THE ALFRED NOBLE MEMORIAL COMMITTEE.

THE ACTING SECRETARY.—Mr. President, I have the report of the Alfred Noble Memorial Committee, of date of April 18th, 1921, signed by Samuel Rea, M. Am. Soc. C. E., Chairman, as follows:

“PHILADELPHIA, APRIL 18TH, 1921.

“AMERICAN SOCIETY OF CIVIL ENGINEERS,  
New York City, New York.

“GENTLEMEN.—The Alfred Noble Memorial Committee has not made any progress report to the Society since it met in Convention at Portland, Ore., August 10th to 12th, 1920.

“Since that time the Memorial Committee has had several meetings with Paul W. Bartlett, sculptor, and Glenn Brown, architect, in an endeavor to agree upon a design to be used as a basis for soliciting subscriptions from the members of the American Society of Civil Engineers and associated societies for the completion of the memorial. The conferences with Messrs. Bartlett and Brown have failed up to this time to result in a selection of a definite design, largely on account of existing excessive costs of materials and labor that will be required for its execution and construction.

“The Memorial Committee has found difficulty in the past in arranging meetings of its membership and on February 17th, 1921, George S. Webster, President of the Society, was added to the Committee, and to take care of the resignation of Dr. Charles Warren Hunt, Secretary and Treasurer of the Committee, who was compelled to resign on account of illness, Mr. Robert Ridgway was elected to the membership of the Committee and has accepted the work of Secretary and Treasurer. Mr. Onward Bates, who has been Chairman of the Committee for some time, because of his residence in Chicago, found it difficult to attend meetings as Chairman, and his resignation of that office was accepted, but Mr. Bates was prevailed on to remain on the Committee.

“The Committee as now constituted consists of the following members: Samuel Rea, Chairman; Robert Ridgway, Secretary and Treasurer; Onward Bates, George S. Webster (*Ex-officio*), George Gibbs, S. H. Hedges, F. H. Newell, Hugh L. Cooper.

“The Committee as now constituted believes that, as an early definite recession in the costs of materials and labor may be expected, the time is approaching when active work should begin looking to the adoption of a final design for the Alfred Noble Memorial and the preparation of a conservative estimate of the cost. As soon as the design and cost estimates are in hand, it is the purpose of the Committee to plan the campaign for securing the necessary funds. This plan will be put under way at such time and in such manner as the members of the Committee may decide.

“In order to properly commemorate Mr. Alfred Noble's professional work, and through it the Engineering Profession in the United States, and to occupy the eligible site in the City of Washington granted by Congress, the cost incident

\* See page 43 of Papers and Discussions.



to the design and erection will, owing to changed conditions, probably be double the earlier estimates.

"Your Committee regrets that it is not at this juncture able to report specific and definite progress for the reasons above indicated, all of which must be apparent to the members of the Society. The delays that have occurred in this very worthy endeavor, growing out of the late war, have been very distressing to every one concerned, but these delays do not evidence any lack of confidence or interest on the part of your Committee in the eventual success of the work in hand.

"Respectfully submitted,

"(Signed) SAMUEL REA,

"Chairman."

THE PRESIDENT.—What is the pleasure of the Convention with reference to this report?

RICHARD L. HUMPHREY, M. Am. Soc. C. E.—I move that the report be received.

A MEMBER.—I second the motion.

THE PRESIDENT.—The motion has been made and seconded that the report be received. All of those in favor please say "aye"; those opposing, "no".

(The motion was carried unanimously.)

THE ACTING SECRETARY.—Mr. President, I have to report the election by the Board of Direction, at its meeting of April 25th, 1921, of twenty-two Members, seventy-two Associate Members, ten Juniors, and to announce that the Board has transferred from the grade of Junior to that of Associate Member, ten\*. I would also announce the following deaths:

JOHN BAILLIE HENDERSON, of Brisbane, Queensland, Australia, elected Member, June 4th, 1890; died February 15th, 1921.

WILLIAM GLYDE WILKINS, of Pittsburgh, Pa., elected Member, December 4th, 1889; died April 12th, 1921.

(Announcements of local interest followed.)

THE PRESIDENT.—The Secretary has no further announcements. In behalf of the Board of Direction, I am authorized to state that the Board, during the past few days, has been endeavoring to adopt measures which would advance the interests of the Society, as follows:

1.—On the recommendation of the Publication Committee the Board of Direction has decided to return to the old method of publishing all papers and discussions in *Proceedings*, instead of issuing them in pamphlet form as at present, but using a 4½ by 7½-in. type page.

2.—The Board of Direction has approved the appointment of a Committee to Promote the Technical Interests and Activities of the Society, to consist of seven Corporate Members widely distributed geographically and representing different branches of Civil Engineering, whose duties shall be to stimulate interest and activities along technical lines. This Committee shall be empowered to select and recommend to the Board of Direction for appointment a sub-committee in the District of each Director.

3.—A Committee of the Board of Direction has now under consideration recommendations of personnel for a Committee on Research of seven or nine members to organize, stimulate, and supervise the research work of the Society as

\* See p. 448.

conducted by its Committees or through co-operation with societies and individuals.

This same Committee of the Board (of which Past-President Talbot is Chairman) has also under consideration the personnel of not more than fifteen representatives (to include the Committee on Research) of the Society on the Advisory Committee on Civil Engineering of the Division of Engineering of the National Research Council, whose duties shall be to represent the Society in its responsibilities therein as Sponsor Society in research work in Civil Engineering.

Under the heading "new business" is the report of the Committee on Referred Amendments to the Constitution.

MR. HUMPHREY.—Mr. President, it being near the noon hour, may I suggest that this report, which will entail considerable discussion, be deferred until this afternoon, and be made the first business at 2 o'clock? It would be more convenient, and I therefore move that this report be made the first order of business at 2 o'clock this afternoon, after the recess.

T. U. TAYLOR, M. AM. SOC. C. E.—Mr. President, I suggest that we simply present the report, and defer any discussion of it until this afternoon.

MR. HUMPHREY.—I will adopt that, and make my motion to include that suggestion.

A MEMBER.—I second the motion.

THE PRESIDENT.—It is moved and seconded that the discussion of the report of the Committee on Referred Amendments be deferred until this afternoon's session.

(The motion was unanimously carried.)

PETER JUNKERSFELD, M. AM. SOC. C. E.—I offer the following:

"APRIL 27TH, 1921.

"TO THE AMERICAN SOCIETY OF CIVIL ENGINEERS  
IN ANNUAL CONVENTION ASSEMBLED.

"In compliance with instructions from the Annual Meeting in New York on January 19th, 1921, the Committee on Referred Amendments prepared a draft of a new Constitution and By-Laws, which under date of February 17th, 1921, was submitted by more than five Corporate Members of the Society to the Acting Secretary, and on March 19th, 1921, was forwarded to the entire membership in the form of an amendment to the present Constitution.

"Since that date the Committee on Referred Amendments has given further study to this matter, and submits herewith certain further amendments for the purpose of correcting typographical errors, and to make the instrument more clear in points which seemed susceptible of different interpretation.

"The Constitution and By-Laws as submitted to the membership under date of March 19th have been endorsed by resolutions from Local Sections in Chicago, Louisiana, Spokane, and San Francisco. Favorable endorsement has also been received from a large number of the members of the Society from all sections of the country. Informal expressions of approval have been received from members of Local Sections at Atlanta, Boston, and Kansas City.

"The Committee has received both verbal and written suggestions for a considerable number of changes and amendments to the instrument which is now before you, and to which it has given earnest thought and study. The Committee, however, is of the opinion that to accomplish a definite forward step in the matter it will be best not to make changes at this time, but would recommend that all such changes be referred either to the Board of Direction or to a special committee for further consideration at a later date.

"The proposed revised Constitution and By-Laws already before the membership, and the seven amendments presented herewith, have been prepared by advice of Counsel for the Society, and by unanimous vote of the Committee are hereby recommended for adoption.

"The Committee asks that it be now discharged.

(Signed) "P. JUNKERSFELD, *Chairman*,

"J. F. COLEMAN,

"A. D. BUTLER,

"E. J. SCHNEIDER,

"L. R. ASH,

"L. L. HIDINGER,

"P. H. NORCROSS."

The further amendments referred to in this report are as follows:

"*Constitution: Article VII.*—In Section 1, strike out the words 'District No. 1 shall include New York City' and substitute the following: 'District No. 1 shall be the territory within fifty miles of the Post Office in the City of New York.' In Section 4, after the words 'June 3rd' insert the following clause: 'No vote of a Corporate Member for a nominee for Vice-President resident outside of the zone in which the voter resides shall be counted; no vote of a Corporate Member for a nominee for Director resident outside the district in which the voter resides shall be counted.'

"*Constitution: Article X.*—In Section 2, omit the word 'several' at the end of the second line. In Section 3, omit the word 'several' in the middle of the third line.

"*By-Laws: Article V.*—Substitute the attached article\* entitled 'Student Chapters', adopted by the Board of Direction on January 17th, 1921.

"*By-Laws: Article VI.*—Omit the line reading as follows: 'Appointment of Members of the Nominating Committee.'

"*By-Laws: Article VII.*—Add the following article entitled 'Transitory':

"ARTICLE VII. (TRANSITORY).

"At least thirty days before the Annual Meeting to be held in the month of January in the year 1922, there shall be mailed to every Corporate Member whose address is known, a letter-ballot with envelopes for voting. This ballot shall include the names and residences of all persons nominated in accordance with the provisions of Article VII of the Constitution as in force up to the time of the going into effect of this amendment, with the grades of membership, and in the case of nominees for Directors, the number of the Districts in which they reside; and in addition thereto such additional Nominations by Declaration as shall be made and filed with the Secretary before the first day of December, 1921, in accordance with the provisions of Section 7 of Article VII of the Constitution as amended. Under the names of the nominees for each office so printed, there shall be provided a space for the use of the voter if he desires to substitute another name. Nominations by Declaration shall be distinguished by some convenient marking or words. There shall also be printed on the ballot the names of the Nominating Committee as created by Section 2 of Article VII of the Constitution as in effect prior to November 1st, 1921, with the numbers of the Districts which the appointed members represent, and also in a separate list thereon the names and residences of the signers of each Nomination by Declaration. The voters may strike out the name of any nominee printed on the ballot for whom they do not wish to vote, and may substitute therefor in writing or by pasteur the name of any person eligible for the office, but the number of names voted for any office shall not exceed the number of persons to be elected to such office. Ballots not complying with these provisions shall be rejected.

"The conduct of the election at the Annual Meeting to be held in January, 1922, shall in all other respects be as provided in Sections 9 and 10 of Article VII of the amended Constitution.

\* See page 550 of Announcements.

"Directions in accordance with these provisions shall be issued with the ballots.

"This By-Law is transitory and is to provide only for the procedure at the Annual Meeting in January, 1922, and this By-Law shall thereafter be void and of no effect."

Mr. President, I move that this report, together with the amendments attached thereto, be adopted.

A MEMBER.—I second the motion.

Mr. HUMPHREY.—I rise to a point of order on the adoption of the report, as we have adopted the rule that we shall discuss the proposed Amendments at 2 P. M., after the recess.

P. H. NORCROSS, M. AM. SOC. C. E.—Mr. President, I move that we defer the discussion of this report until this afternoon.

(The motion was again carried.)

(The meeting then recessed until 2 P. M.)

## SECOND SESSION—BUSINESS MEETING

**Wednesday, April 27th, 1921.**—The meeting was called to order at 2.20 P. M.; President George S. Webster in the chair; Herbert S. Crocker, Acting Secretary; and present, also, about 220 members and guests.

THE PRESIDENT.—Gentlemen, before we adjourned, the report of the Committee on Referred Amendments was read. We now have some written communications bearing on that subject, and if there is no objection I will ask the Secretary to read them.

### ACTION OF LOCAL SECTIONS ON REVISION OF CONSTITUTION.

THE ACTING SECRETARY.—The following resolutions were passed by the Louisiana Section of the Society, on April 13th, 1921:

"Whereas, it appears to be generally recognized that the present Constitution of the American Society of Civil Engineers has been outgrown by the Society, and

"Whereas, several past efforts for its improvement have met with defeat largely because of differences of opinion on relatively unimportant details in the proposed Amended Constitutions, and

"Whereas, there is now before the Society an Amended Constitution and By-Laws which, in its main essentials, is a distinct improvement upon the existing Constitution, now, therefore,

"Be It Resolved: That the Louisiana Section of the American Society of Civil Engineers in Annual Meeting assembled hereby endorses and approves the proposed Amended Constitution and By-Laws, and recommends to the Annual Convention to be held in Houston, Tex., on April 27th, 28th, and 29th, 1921, that the said Amended Constitution and By-Laws be passed to letter-ballot."

The following resolution was adopted by the Illinois Section on April 13th, 1921:

"Resolved: That this meeting approve the draft of the new Constitution as prepared by the Committee on Referred Amendments, and submitted with letter of Acting Secretary, of March 19th, 1921, and recommended that the Houston Convention adopt the said draft."



The following are resolutions from the Spokane Section, adopted March 30th, 1921: \*

*"Whereas, the proposed revised Constitution as submitted by the Committee on Referred Amendments, has been discussed before, and carefully considered by, the Spokane Section of the American Society of Civil Engineers; and*

*"Whereas, the members of this Section feel that the adoption of these amendments would greatly broaden the influence of this Society, extend its activities, and aid in stimulating its growth and scope of service; now, therefore,*

*"Be It Resolved: That the Spokane Section of the American Society of Civil Engineers endorse and urge the adoption of the proposed Amendments by the 1921 Annual Convention to be held at Houston, Tex.; and*

*"Be It Further Resolved: That a copy of this resolution be sent to the Secretary of the American Society of Civil Engineers."*

The following is from the New York Section:

"TO THE BOARD OF DIRECTION AND THE

"ANNUAL CONVENTION OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS:

*"Whereas, the second sentence in Section 1, Article VII, of the Constitution of the American Society of Civil Engineers, which reads as follows: 'District No. 1 shall be the territory within fifty miles of the Post Office in the City of New York', has been amended to read as follows: 'District No. 1 shall include New York City'; and*

*"Whereas, a very considerable number of the engineers now engaged in professional life in New York City reside outside of the city within the Metropolitan District; and*

*"Whereas, the Metropolitan District of New York, as described in the present Constitution is an economic whole, and must be so considered from an engineering standpoint; and*

*"Whereas, this principle has been recently recognized by legislative action in several instances by the States of New York and New Jersey; and*

*"Whereas, the entire programme of the New York Section, since its organization, has been founded on the recognition of this principle, and has been directed toward the education of the engineering and public minds toward a realization of this fact; and*

*"Whereas, the limitation of District No. 1 to New York City would limit the Local Section to New York City; and*

*"Whereas, the limitation of District No. 1 to the limits of New York City, which would be possible under the proposed Amendment, would be a serious blow to the New York Section and to the influence of the Engineering Profession within the District, by destroying the only body qualified to speak for it;*

*"Resolved: That the New York Section of the American Society of Civil Engineers protests against the proposed change in Article VII, Section 1, and requests that the wording in the present Constitution be retained, and*

*"Resolved: That a copy of these resolutions be forwarded to the Board of Direction and to the Secretary, to be laid before the Annual Convention when the new Constitution shall be taken up for consideration.*

*"Adopted at a regular business meeting of the New York Section of the American Society of Civil Engineers, held on April 20th, 1921.*

*"WILLARD T. CHEVALIER,  
"Secretary."*

The following resolution was adopted by the San Francisco Section on April 19th, 1921:

*"Resolved: That the San Francisco Section of the American Society of Civil Engineers, in regular meeting assembled, on the 19th day of April, 1921, after*



open discussion of the proposed Revised Constitution and By-Laws of the Society submitted by the Committee on Referred Amendments, hereby records its general approval of the document as published, without prejudice to Amendment in minor particulars, and extends its unqualified commendation to the Committee for its painstaking and eminently practical efforts to simplify and strengthen the fundamental law of the Society."

The following report of a committee of the Cincinnati Section was accepted at a meeting of the Section held on April 19th, 1921:

"TO THE CINCINNATI SECTION,

"AMERICAN SOCIETY OF CIVIL ENGINEERS.

"GENTLEMEN.—Your Committee reports as follows:

"District No. 1 has practically one-fourth of the Corporate Membership of the Society. One of the four Vice-Presidents must be a resident of that District. The Secretary and the Treasurer must reside in District No. 1 during their terms of office, but can be elected from any District. Six of the eighteen Directors must now represent District No. 1. While this is a somewhat greater proportion of the Directors than one-fourth (which would correspond to the membership), the local Directors have, necessarily, more work to do in the practical management of many of the affairs of the Society. To avoid an undue increase in the burden on the time and efforts of the Directors from District No. 1, it seems desirable not to reduce their number.

"Your Committee, therefore, report that, in their opinion, it is not desirable to request the Committee on the revision of the Constitution to consider a reduction from the present representation of District No. 1.

"Very respectfully,

(Signed) "J. A. McDONOUGH,

(Signed) "C. N. MILLER."

The following letter from Edward W. Howe, M. Am. Soc. C. E., was received:

"APRIL 18TH, 1921.

"TO THE ACTING SECRETARY,

"AMERICAN SOCIETY OF CIVIL ENGINEERS.

"DEAR SIR.—I am sending you herewith a duplicate of a letter I have sent to the Chairman of the Committee on Referred Amendments, which explains itself.

"As I shall be unable to attend the Convention at Houston, Tex., and as, owing to the short time intervening, my letter may fail to reach the Committee in season for it to act, I would respectfully request that the following amendment may be offered to the proposed revised Constitution, and that such use may be made of my letter enclosed as will explain the reason for the amendment:

"In Section 5 of Article IV, strike out in the second line \$325.00, and insert in place thereof \$200.00; also strike out \$225.00, and insert in place thereof \$150.00; in the third line, strike out \$100.00, and insert in place thereof \$50.00; in the ninth line, strike out \$75.00, and insert in place thereof \$50.00; also strike out \$325.00 and insert in place thereof \$200.00; and in the eleventh line, strike out \$225.00, and insert in place thereof \$150.00.

"Yours very truly,

(Signed) "EDWARD W. HOWE."

This letter is accompanied by a letter of date of April 18th, 1921, addressed to the Chairman of the Committee on Referred Amendments, and explaining in detail the manner of deriving the figures in the proposed amendment, which I shall not read unless the meeting so desires.

THE PRESIDENT.—Those are all the written communications, gentlemen. Just before noon we heard read the report of the Committee on Referred Amendments, and that subject is now open for discussion.

J. N. CHESTER, M. AM. SOC. C. E.—Mr. President, with reference to the communications that have been received from the different Sections, inasmuch as all the Sections have been instructed by the Board of Direction that when such communications are forwarded they should be accompanied by a statement of the number of members attending the meetings, and the number of members voting in the affirmative, is it not pertinent for this meeting to have the benefit of this information in connection with the communications from the different Sections that have been read by the Acting Secretary?

THE PRESIDENT.—Mr. Secretary, have you the information as to how many were present?

THE ACTING SECRETARY.—I have in some cases, but not in all. In the case of the Louisiana Section, President Dusenbury was in the chair, E. F. Deléry, Secretary, and the total number of members present was 10.

As to the Illinois Section, I have not the desired information.

In the case of Spokane Section, I have no statement of the number present—I have written for the desired information, but have received no reply. The action, however, was unanimous in so far as those present were concerned.

A. D. BUTLER, M. AM. SOC. C. E.—Mr. President, I think that I can speak for the Spokane Section, having been present at the time the resolution was adopted. My memory is that there were 13 present.

THE ACTING SECRETARY.—In the case of the New York Section, I do not have the information. In the case of the San Francisco Section, 67 Corporate Members were present, and the total attendance was 75.

At the meeting of the Cincinnati Section, Mr. E. D. Gilman in the chair, 12 members were present.

That covers all of them.

W. W. DEBERARD, ASSOC. M. AM. SOC. C. E.—Mr. President, I can state on behalf of the Illinois Section, that there were between 25 and 30 present. There were 30 at the beginning of the meeting, and when we took the vote it was unanimous, with approximately 25 present.

J. F. COLEMAN, M. AM. SOC. C. E.—I may state, gentlemen, in behalf of the Louisiana Section, that 10 members were present, and that the vote was unanimous.

GEORGE G. ANDERSON, M. AM. SOC. C. E.—Mr. President, gentlemen and fellow members of the American Society of Civil Engineers: Last year, at the Portland Convention, I made a remark somewhat in the spirit of banter, which I believe I can repeat—I believe earnestly that I can repeat—in all seriousness, at this time. I said at Portland that all the members there had become progressives. I said it then in the spirit of banter. I say now with conviction, that all of us are progressives, and I may, in my own mind, have to eliminate that word “progressives.” I think that we are all imbued with the spirit of earnestly striving to build up this fine organization.

I am very much impressed with the report which has been read from the various Sections, and with the attitude of mind of this gathering in that direction, and I believe what all of us have been striving for is clearly indicated by the

gathering together of the members of this Society in these Sections and at this Convention, seriously to consider what we best can do to further the interests and the welfare of the Society. We may have differing opinions about that, but it is progress to come together and exchange those opinions and impressions in an attitude of fair-minded consideration, one with the other. That is so much of a step forward.

We have another step before us in the report of this Committee on Referred Amendments on a revised Constitution. I know that the members of that Committee have served faithfully and well. They have made an able report, which is entitled to our very best consideration. We may not all like it; we may not all like all of its details, but it is unquestionably a step forward. Now, I am going to ask the members here assembled to consider an amendment which I am to offer in the spirit of fair-mindedness. It is more or less of a detail, and at the same time it incorporates in the revised Constitution what I believe is essential to incorporate at this time, bearing in mind that progress and development of the organization is what we are all seeking.

#### PROPOSES REVISION OF PARAGRAPHS STATING OBJECTS OF SOCIETY.

I call your attention to Section 3 of Article I of the Constitution, in which the objects of the Society are stated. I will preface the presentation of the amendment, or the substitute which I offer, with the remarks that the purpose of this substitute is twofold; First, to continue, in so far as possible, the declaration of the objects of the Society as they have been stated from time to time in our past history; and, second, to incorporate in them what I am quite sure has obtained the consent and the sanction and the approval of all the members of this organization in the past, what you will recall that the Committee on Development, early in its deliberations, adopted as more or less of a slogan, that this organization should become a National force in an economic, industrial, and civil concept. These two things it is my purpose to cover in offering the substitute for this Section. As presented by the Committee the Section reads:

"The objects of the Society shall be the advancement of the sciences of engineering and architecture in their several branches, the professional improvement of its members, the encouragement of intercourse between men of practical science, and the establishment of a central point of reference and union for its members."

I move that for that Section there should be substituted the following:

"The objects of the Society shall be the advancement of engineering knowledge and practice, and the maintenance of a high professional standard among its members, the encouragement of intercourse between men of practical science, the establishment of a central point of reference and union for its members, and cooperation with other technical organizations in important economic, industrial and civic movements in which the members of this Society are particularly well qualified to advise the public."

MR. NORCROSS.—Mr. President, I rise for information. There is a motion before the house which has been seconded, I believe, but it is quite possible that I am in error. Before Mr. Anderson can offer an amendment, he will have to offer a substitute for the Committee's amended Constitution. I simply rise for information, because I think that possibly Mr. Anderson may be out of order, as I believe that a motion was made before noon, which was seconded, and it was my understanding

that this was to be discussed. Mr. Anderson has offered an amendment to the Constitution, the consideration of which is now out of order.

THE PRESIDENT.—There was a motion to adopt the report. Now, what is your position, Mr. Anderson? You offered an amendment to the report?

MR. ANDERSON.—Yes, sir.

THE PRESIDENT.—The report, I understand, was the amended Constitution.

MR. NORCROSS.—That was an amendment to an amendment which Mr. Junkersfeld offered.

THE PRESIDENT.—Mr. Junkersfeld made a report of your Committee, and that report is now open for discussion.

MR. NORCROSS.—That is correct, Mr. President.

THE PRESIDENT.—Mr. Anderson moves to amend one feature of that report.

MR. NORCROSS.—The report did not refer to that particular feature. That report only is now up for discussion by the meeting.

MR. ANDERSON.—May I ask if that report does not bring with it the report of the revised Constitution?

MR. NORCROSS.—No, sir; the revised Constitution was submitted to the membership of the Society in February.

MR. CHESTER.—Mr. President, my understanding of the case is this: Mr. Junkersfeld and Mr. Norcross are of the opinion that the mailing of this original draft of the Constitution which they prepared is automatically followed by a motion to accept. Now, they appear here to-day and present it for the first time in a public meeting, not as it was originally mailed, but with some corrections.

THE PRESIDENT.—That is correct.

MR. CHESTER.—I believe, therefore, that a decision as regards this procedure would clear the atmosphere. I believe that they are wrong.

MR. COLEMAN.—Mr. President, according to my understanding of the Constitution, as it affects this matter, the proposed revision of the Constitution and By-Laws which was sent to the Secretary on February 17th, 1921, and was sent out by mail in March, are before this Convention. The language of the Constitution, as I remember it, is that this proposed revised Constitution and By-Laws shall be passed to letter-ballot in the form in which they are presented, or in such form as they may be amended by a majority vote of the Convention. It does not require, as I understand it, any formal motion to approve the revision of the Constitution as it has been sent out, in order that it may go to letter-ballot. If this Convention should adjourn without taking any action on that document, it would automatically go to letter-ballot, if I understand the present Constitution correctly.

Now, therefore, the Committee on Referred Amendments did not submit this document in the paper that was read before you this morning. It reported to this meeting the activities of that Committee, according to its understanding of the instructions which that Committee received from the Annual Meeting held last January. Incidental to the transmission of that report, it submitted certain amendments to the document which is before you, and the motion was that the report so submitted, together with those amendments, be approved. That is the motion which I understand to be before the meeting for discussion. It seems to me, according to my understanding of the constitutional provisions, that motion only



is up here for discussion. The other amendments, such as proposed by Mr. Anderson, or such others as may yet be proposed by others, should come before this body after action is taken on the motion which is now before the meeting.

GARDNER S. WILLIAMS, M. AM. SOC. C. E.—Mr. President, allow me to suggest that when the morning session adjourned, the motion which was then pending disappeared. It did not carry over to this session. Now we have before us the new Constitution, as a special order of business at this time. It seems to me that the most desirable way to proceed—and I simply offer this as a suggestion, gentlemen—would be to consider the amended Constitution article by article, and when those articles are reached to which the amendments proposed by the report are germane, that the Committee then propose them in the ordinary way. I think that we can get along faster that way, and we will accomplish things more to our satisfaction. Of course, it might be considered proper for the Committee to move the amendments to the Constitution now before us, and they could then be dealt with *en bloc*. It seems to me, however, that we will get a more satisfactory treatment of the subject if we deal with this Constitution section by section. I hope this will meet with the approval of the Committee, and that one of its members will make such a suggestion or such a motion, because I feel that this matter is largely in their hands, and I feel that it is their desire, as it is that of the rest of us, to have a full and free discussion of their work.

ARTHUR N. TALBOT, PAST-PRESIDENT, AM. SOC. C. E.—Mr. President, this seems to me rather a strange procedure for us to take. I understood that the Chairman of the Committee was presenting an amendment to the Constitution. If he is presenting a report of the Committee, I find a report on page 18 of this printed document entitled "Report of the Committee on Referred Amendments to the Board of Direction." And there is nothing in that report which we need to discuss in regard to the form of these amendments.

What I think we ought to be discussing, however, is the proposal by the eight members whose names are signed to the proposed revised Constitution on page 2 of this pamphlet. If we are to discuss that, then it seems to me that amendments are clearly in order, and that we ought to take them up in the proper way, by going through each, section by section, so that if any amendments are to be proposed, they may be made and discussed and voted on as is provided by our present Constitution. I hope, therefore, that we may get this cleared up, either by considering that we are now discussing amendments to the Constitution, or that we are to take up just the material changes given on pages 18 and 19 of this printed document.

THE PRESIDENT.—As I understand it, the whole question of the revision of the Constitution is now before the meeting for discussion.

MR. TAYLOR.—Mr. President, do you rule that the motion made just before we adjourned the morning session is now pending business? I made the motion at that time to adjourn to 2 P. M., thinking that said motion was the pending business to be brought up at this time.

THE PRESIDENT.—There was a motion made before adjournment that the discussion be taken up immediately after recess.

MR. TAYLOR.—That is the pending business.



MR. CHESTER.—Mr. President, to put the matter in the shape to rule on, I second Mr. Anderson's motion.

DISCUSSION ON MR. ANDERSON'S AMENDMENT.

THE PRESIDENT.—I will rule that Mr. Anderson's motion is a proper one to come before the meeting at this time.

MR. TAYLOR.—Mr. President, may I inquire what is the difference between the two sections? I would like to have Mr. Anderson explain that.

MR. ANDERSON.—The difference between the two sections is that the language used in Section 3 of Article I of the proposed Constitution as it is printed does not entirely repeat the language which has always appeared in the printed Constitution. I offer this amendment to continue that as nearly as possible. It is historical, and perhaps sentimental, giving a clear definition of the purposes of the Society along technical lines. The second paragraph, or the second part of my amendment, which reads "and co-operation with other technical organizations in important economic, industrial and civic movements, in which the members of this Society are particularly well qualified to advise the public", is offered as an explanation of and to continue the policy which has been suggested by the Committee on Development, and which had been adopted by the Society several times. That is the whole purpose of this amendment.

THE PRESIDENT.—Is there any further discussion on the amendment proposed by Mr. Anderson?

MR. NORCROSS.—Mr. President, I desire to answer Mr. Anderson in a very few words by saying that the wording of this particular section of this particular article is different from the original Constitution, and there are many other sections and various other articles of this proposed Constitution that are different from the old ones. As I understand it, that was the purpose of the Committee's work. The wording of this particular section is in accordance with the ruling of the Attorney for the Society as to the proper language, and while I have not had an opportunity to study the wording as offered by Mr. Anderson, I wish to reiterate what the Committee desires to say, and has said before, that it does not concur in any changes in the wording that it has offered, because it believes that it has proposed wording that provides a machinery for the proper operation of the Society.

THE PRESIDENT.—Is there any further discussion?

L. L. HIDINGER, M. AM. SOC. C. E.—Mr. President and gentlemen: The words that we have used in this draft are the exact words given in the Charter under which this Society is organized. We had up for discussion with counsel for the Society the possibility and the advisability of putting in a broader statement, such as Mr. Anderson has proposed. The attorney held that we had no authority, whatever, to do that. It would be absolutely void if we did, because we would be going further than the Charter gives us the authority to go.

C. E. GRUNSKY, M. AM. SOC. C. E.—I would like to ask the Committee on Referred Amendments whether, under the language as given and proposed in this amendment, the Society will have the power to co-operate with other organizations, whether the Committee has made that inquiry, and whether, therefore, the intent

of Mr. Anderson's amendment will be fulfilled by this language as proposed by the Committee.

CONSTITUTION GIVES AUTHORITY TO CO-OPERATE.

MR. COLEMAN.—I think that I can answer that question, gentlemen. The Committee did specifically request that information at the hands of counsel, Messrs. Parker and Aaron, who have been counsel for the American Society of Civil Engineers for a great many years, and it was advised that the Society had all the authority which it needs, even under the language of the present Constitution, and would continue to have such authority under the proposed new verbiage, to co-operate with other bodies of engineers.

MR. HIDINGER.—Mr. President, one more point: Are we discussing the amendment to the Constitution proposed by the eight members—not the Committee, but just the eight members—or are we discussing that which has been brought in here by the Committee? I would like to have that made clear, because we have referred to members of the Committee, as the Committee, and Mr. Grunsky put this question to the Committee. Now, if this question is directed to the Committee, it would be out of order. I rise to a point of order, Mr. President.

THE ACTING SECRETARY.—Mr. President, as I understand it, the eight members who propose the amendment are the Committee, the personnel being the same in the two cases.

THE PRESIDENT.—Is there any further discussion of Mr. Anderson's motion?

MR. CHESTER.—I do not want to speak too often, but I do want to make a suggestion in regard to following the advice of the attorneys of the Society. If we cannot enlarge or grow or progress under the advice of the present attorneys, it might be well to secure further legal advice.

MR. TAYLOR.—The whole difference, then—and finally I have it down now to brass tacks—is simply this: Whether, under the proposed verbiage, we have a right to talk to, speak to, co-operate with, or have intercourse with other societies, or not. "The encouragement of intercourse between men of practical science"—my feeling is that we do not want to have intercourse with anybody who is not a practical scientist. It seems to me that we have unlimited authority to co-operate with these people, if they are men of practical science, and every engineer ought to fulfill that definition. If that wording is not broad enough to cover the whole universe, all the engineering associations of America and anywhere else, then I do not know what the English language means.

It seems to me that if we commence hammering on these little changes in the verbiage, we never will get through, and the best thing is to adopt this as proposed. I do not want to cut off debate, but I would like to move the previous question.

THE PRESIDENT.—Gentlemen, you have the amendment as offered by Mr. Anderson. Is there any further discussion?

MR. DAVIS.—Mr. President and gentlemen of the Society: I wish to concur in what has just been said by Professor Taylor, and to call the Convention's attention to the fact that that particular question as to whether we might co-operate with other associations by joining the Federated American Engineering Societies, was passed on by the Society's legal counsel, and they ruled that our Constitution

as it now stands, did not forbid it and that there was no question about it. The powers of this Society as a corporation are bound, not by the Constitution entirely, or mainly, but by its Articles of Incorporation, and if we want broader powers than we can get under our present Constitution, or any other Constitution, the remedy is not in seeking other legal advice, but in amending our Articles of Incorporation.

Now, the amendment that the Committee has proposed simply brings into harmony the objects stated in the Constitution with those stated in the Articles of Incorporation. We cannot deviate from them in any essential particular, and what has been said shows clearly that this matter has been thought out by the Committee, which has formulated this amended Constitution and has presented it to us. It is plain that the Committee understood its job and has done it right. If we have, under the present Constitution, the right to join the Federation under this wording, it does not change the Articles of Incorporation, and is nearly the same as the present Constitution. We have, therefore, according to legal counsel and according to common sense, the same broad powers under that wording that we would have if it were exactly the same as the present Constitution. It is just a little verbiage that makes no essential difference in the meaning.

#### ANTIQUATED CONSTITUTION MUST BE REVISED.

Now to get down to the main and essential point, however: The question before us is how to get rid of an antiquated Constitution that we have been trying to amend ever since I can remember, and every time that any essential or progressive amendment to that Constitution arises, it fails, for one reason or another. One reason is that it requires a two-thirds majority to carry any amendment to the Constitution, and the more you put into any amendment, the more people you strike who are opposed to it and who will vote against it, and the broader you make it, the less chance you have to make it carry. This Committee has had the good sense to recognize that fact, and to make just as few changes as possible in the present Constitution, and so it appears to me that there should be just as few changes as possible to make it a workable Constitution and By-Laws, instead of a great mass of wording that nobody can understand.

It is not possible for a Convention like this, during a debate in which there are points of order being made, and on which there are rulings to be called for all the time, and differences of opinion arising at all points, to thrash out these fine points and find out whether or not the amendments offered conflict with other provisions of the Constitution. We found that out by experience. We know that if we attempt that we may make a failure of it.

The main point is whether or not we are going to amend the present Constitution. If we take the wording of this Committee—the work of which has extended over a period of several months, with careful comparisons, paragraph by paragraph, with other parts of the Constitution—we can put it through not merely by a two-thirds vote, but by a three-fourths or a four-fifths vote, in my judgment. If we undertake to amend it in any essential particular, we antagonize some, and every single time we do that, we lose votes; it does not take long to lose a third of the votes, and when you have done that, you have lost the Constitution.

The first and best thing, in my opinion, that the Committee's report does is to separate the things that appear to belong in a Constitution from those that belong in By-Laws, where they can be easily amended. If the Committee had done nothing more than that, as wisely and carefully and industriously as it has, its efforts would have been well expended, and we could well afford to put ourselves behind it and put it through with the same provisions as are in our present Constitution; for then we will be able to amend the By-Laws, and if we never get any further amendment, we would at least have a Constitution that the members could understand. The Committee has carefully separated the essentials from the non-essentials. I say that mainly on my general judgment of what the Committee has accomplished, because its members have given this a great deal of study, and have arrived at proper conclusions in almost all cases, in the estimation of my poor judgment. I have not been able to find anything in the By-Laws that belongs in the Constitution, nor in the Constitution that belongs in the By-Laws—at least, not without considerable question. I might perhaps, have been more liberal, and put more in the By-Laws and less in the Constitution.

If there was no other improvement in the present Constitution than that, it is well worth having, and every change we attempt to make in the wording does two things: First, it antagonizes some, so that they will vote against it; and second, it creates a suspicion that we have introduced something that is inconsistent with the rest, and those who see fit to oppose it will, of course, say so; but they have to make out a good case to show that they are more acute and more thorough than this Committee has been in the past six months that it has given to a study of this Constitution.

Mr. President, I do not suppose that there is a man in this audience, including myself, who does not believe that he could write a Constitution with satisfaction to himself, better than this one. I know that I could. I presume every member of the Committee believes so, and I presume, in fact, that the proposed revised Constitution is submitted as a compromise by the members of the Committee. If we undertake to make these modifications I am sure we will get into trouble, and it is my conviction that an amended Constitution is so important to the future of this Society for the next two years that its adoption should not be imperiled by further amendments here.

MR. WILLIAMS.—Mr. President, I rise to a point of order.

FRANCIS LEE STUART, M. Am. Soc. C. E.—Mr. President, the proposed Constitution, as presented, is a disappointment to me. I would change it in many respects, but it represents the efforts of eight able men, without any influence brought to bear on their judgment. So far as I know, there is nobody that takes an active interest in this Society that has talked to them. I have not, for one, and it is very close to my heart. I have not said anything to them about it, but they have brought the result of their work here and presented it to us, and I think that we should accept it. I will use all the influence I can to get members to accept it, because it is so evidently an advance for the Society.

The present Constitution is too cumbersome. There are many things in it that are wrong, I think, but my judgment is only one in five thousand. Therefore, I am going to defer my judgment on the subject and vote for the proposed revised



Constitution, and in this meeting vote against any amendment to it. If you start to amend the first paragraph, you are going to amend the next sixteen, and you will have chaos as the result, and nobody will vote for it.

J. C. NAGLE, M. AM. SOC. C. E.—Mr. President, I want to speak to the amendment just a moment, and I would like to speak particularly to some of the members of the Texas membership present, whom I know have not read the proposed Constitution. I happen to know that some have not read it. I have read it carefully, and as one of the Past Vice-Presidents of the Texas Section, I want to commend the Constitution as submitted by the Committee, with the amendments, to your consideration, and ask for your vote in its favor.

I shall vote against Mr. Anderson's amendment, although I am in sympathy with the verbiage, for the reasons we have already announced. I believe that those matters can better be thrashed out later, and amendments can be offered on these minor points, provided we get, as Mr. Davis has said, a workable Constitution before us, and I shall vote against Mr. Anderson's, and all other amendments, except those offered by the Committee.

THE PRESIDENT.—Is there any further discussion?

(Cries of "Question".)

Do you wish the amendment read, or are you sufficiently familiar with it? All those in favor of the amendment offered by Mr. Anderson will signify the same by saying "aye"; contrary, "no". The "noes" appear to have it, and the Chairman will declare the amendment offered by Mr. Anderson lost.

MR. NORCROSS.—Mr. President, I will call for the question on the original motion made before the recess at noon.

MR. TALBOT.—If there is no objection, I would like to call attention to what seems to me to be an error in the last line of Section 3, Article VII, on page 7: " \* \* \* excepting in such contingency as is provided for in Article V, Section 3, of the Constitution." If I understand rightly, that refers to Section 3 of the old Constitution, and it should be Section 4 rather than Section 3. Am I right in that?

MR. COLEMAN.—I think that you are right.

MR. TALBOT.—Then it seems that under the present form of the revised Constitution, that clause is a redundancy. There is nothing, as I read in Section 4, that requires that action, because if there is a vacancy in the Presidency, the Vice-President then becomes President, and provision is made for having a Vice-President from the same region. If the Vice-President is selected in that way from the Directors in that zone, the provision is made that it should be filled by some one from that District. That being so, it seems to me that we should have that clause omitted. I should like to ask the Committee's opinion on that.

MR. COLEMAN.—Mr. President and gentlemen: The provision in Article V, Section 4, is that a vacancy in the office of President shall be filled by the senior Vice-President, or a vacancy in the office of Vice-President shall be filled by the senior Director from the same zone, seniority between persons holding similar offices being determined in the same way as in the present Constitution.

Now, in the nomination and election of officers it is provided that the Board of Direction shall announce the district boundaries and group the districts into

four zones. Directors from each particular district and Vice-Presidents are to be elected from each zone, so that there always should be one Vice-President from each zone, and a certain specified number of Directors from each district. It was thought possible that the senior Director who would be advanced to the Vice-Presidency by reason of the death or resignation of an existing Vice-President, might possibly not come from that particular zone. This is frankly an omission by the Committee—an oversight. Subsequently, the words “from the same zone”, were written into Section 4 of Article V, and Mr. Talbot’s criticism is a just one. For this reason it would be proper that the part of Section 3 to which he refers, in so far as it makes that exception, should be eliminated; that is, in the proposed Constitution, page 7, Article VII, Section 3, the last line, which says: “excepting in such contingency as is provided for in Article V, Section 3, of the Constitution”, should be stricken out. It would be a correction of the same kind as the amendments which the Committee has already offered, for that particular clause to be removed, and I move that it be stricken out.

MR. TALBOT.—I second the motion.

THE PRESIDENT.—Is there any discussion on striking out the last line in Section 3, Article VII?

MR. WILLIAMS.—That is “excepting in such contingency as is provided for in Article V, Section 3, of the Constitution”?

THE PRESIDENT.—Are you ready for the question? All those in favor please signify by saying “aye”; contrary, “no”. It is so ordered.

#### RESTRICTION OF MEMBERSHIP IN DISTRICT NO. 1.

MR. CHESTER.—Mr. President, I have been very much impressed by the arguments made by Mr. Davis and by Professor Nagle, and I would like to see this Constitution go out for vote, “yes” or “no”, as one vote. Assuming that this will be the action, I should like to ask the generosity of the Committee in the omission of a sentence on page 7, Article VII, being the last statement of the first paragraph of Section 1, which reads as follows: “Members not residing in North America shall be allocated to District No. 1.” I have read that over and have failed to see the justice of a surcharge offered or contributed to District No. 1. If that is dropped, it will place the allocation with the Board of Direction, on which I trust sincerely we will always have a personnel that will, with fairness, take care of our foreign members. I do not offer it as an amendment, but I want to say to this Committee which offers this Constitution that I will promise to go on with all the rest if it will agree to drop, absolutely, that one sentence.

MR. JUNKERSFELD.—Mr. President: Mr. Davis and Professor Taylor and others have given very strong, logical and good reasons why, every time we make a change of this kind, we make enemies somewhere. If we include something that will satisfy one district, how many others will be antagonized by it? It seems to me to be an unwise thing to make that kind of a change at this time. Moreover, it would have very little, if any, practical effect, because those foreign members must be allocated somewhere, and the Committee felt that the logical and best way would be to allocate them to the home office. The Committee considered a great many other allocations, also; for example, the Europeans and Africans to New York, and those from the Pacific Coast to San Francisco. Even under that

arrangement, however, it would not have changed the number of Directors to which New York would have been entitled, so that for the present it would not make any particular difference, but it would have created a good deal of antagonism.

Speaking as an individual, because the Committee has not met since Mr. Chester made his motion, it seems to me unwise, for the reasons so well stated by Mr. Davis and by Professor Taylor, to make this change. The members of the Committee are agreed with Mr. Chester in saying that they would like to see this Constitution go out in the form originally submitted, but since its submission they have given it further study, and these seven amendments, together with the report which is now before you, do correct some errors and have clarified a few points that ought to be clarified.

Now, by the adoption of the motion which is before you, those few points and those few errors will have been changed all the way through. Further, they were referred to the Committee by the Board of Direction. For that reason, I hope the motion will prevail, and that these seven minor amendments will be adopted to clarify what is before you, and so that the whole new Constitution and By-Laws will then be before the membership as one document for vote "yes" or "no".

MR. WILLIAMS.—Describe District No. 1.

MR. JUNKERSFELD.—"District No. 1 shall include New York City." That is the way it appears in this document that went to the membership in March. At the meeting yesterday, and in the motion before you, the Committee recommended that it be changed and the following wording adopted: "District No. 1 shall be the territory within 50 miles of the Post Office of the City of New York." This makes no material change in the Constitution. The number of Directors is six, under the present Constitution. The Board of Direction, according to the present membership of District No. 1, could hardly do anything else than allocate four Directors to New York. In order to do that, they might have to reduce this 50 miles to 40 or 35, but it would not be any very large reduction. Now, a resolution was referred to us by the Board, which you have heard read by the Secretary, stating that the New York Section would strongly prefer to have the 50-mile limit reinstated. Incidentally, this is good for the finances of the Society, for the reason that it fixes absolutely the men who pay the \$5.00 additional, and as far as representation goes, under this correction New York will have a little less representation, and not more. So that the New York people are really giving up something further, and their request makes for clearness.

MR. CHESTER.—May I ask how many members in North America would belong in the New York District?

MR. JUNKERSFELD.—I have not the figures in mind. Mr. Norcross has them.

J. L. O'HEARN, M. AM. SOC. C. E.—Mr. President, if these foreign members are allocated to District No. 1, will their views be the same as those of District No. 1, and will they be getting the benefits of residence in District No. 1?

THE PRESIDENT.—They will not.

MR. HUMPHREY.—I want to call to the attention of the Convention the fact that there are more than 1 000 men who live outside of North America who would

thus go into District No. 1, and it would have a material effect on the representation.

D. C. HENNY, M. AM. SOC. C. E.—Mr. President, before I left Portland, which is in District No. 12, a meeting of the Section was held, and the amended Constitution was approved, with the same exception that was taken by Mr. Chester, and I was requested to take this matter up with the Committee. This I did yesterday. I made the best argument I could. I made the argument that Mr. Chester made—that it did make some difference. I found that the Committee had failed to consider this point, had various reasons for its position, and while I would have been glad to have seen this amended Constitution changed in line with the suggestions made by Mr. Chester, I will say that, rather than forego the necessary unanimity of sentiment, I would prefer to see the amendment stand without any further change. The Committee has many arguments; but if it, after consideration, says it desires this change, I will ignore the instructions of my Section and vote for this amended Constitution as it now stands.

THE ACTING SECRETARY.—Mr. President, I would like to state, for the accuracy of the record, that the total Corporate Membership on February 10th, 1921, was 9 268. Inside the 50-mile radius of New York City were 1 501, outside of North America, there were 560, or a total of 2 061 in District No. 1.

THE PRESIDENT.—Mr. Chester, I do not understand that you made a motion.

MR. CHESTER.—Well, I would like to make it a motion. Inasmuch as I believe that it is the sense of this meeting that the corrections read by Col. Junkersfeld when this subject was presented, should be regarded as corrections and not as amendments, and that the Constitution should go out in that shape, I move that it is the sense of this meeting that we ask the Committee on Referred Amendments, in the presentation of the final draft, the draft that will be sent out, that it omit the last sentence of the first paragraph of Section 1, Article VII.

#### ACTION POSTPONED ON POINT OF ORDER.

MR. WILLIAMS.—I rise to a point of order. The Committee, so far as these amendments which have been submitted are concerned, has no legal status. We refer to the Committee simply as a committee, and I am very glad to refer to it in that way; but there is objection now to an amended Constitution which has been proposed by eight members of the Society. Whether they were a committee before or after they proposed it, makes no difference. It is to be treated just the same as though it had been proposed by five members who were not a committee. Now, if they want to change this printed document, they must come here in the regular way, just as any other member on the floor must come, and propose their amendments and have them voted on and adopted by this meeting. Otherwise, the thing stands exactly as it is printed.

Now, there is no motion before the house, and I think it would be wise to get squared up here. If the Committee wishes to change the language of Section 1 of Article VII in any particular from the way in which it is printed, some one of its members should propose an amendment to that effect and we should have the opportunity to vote on it and adopt it. It is very important that we do these things in a legal, proper manner. If we do not, we do not get any new Constitution, and although I am not entirely in sympathy with this Constitution,



whatever is done here should be done legally, so far as any voting is concerned, and there will be no quibbling.

Mr. TALBOT.—I was about to suggest the same thing. It seems to me that we must be very careful to put this in proper technical form. As the motion was made, it was to adopt the report of the Committee, and the Committee made some amendments. In order to follow the requirements of the Constitution in the way of amendments it is necessary to amend it on the floor of the house. Mr. President, to save time—and I hope the Committee will accept it—I move that the seven amendments proposed by the Committee be applied to the proposed revised Constitution submitted by these eight members, and be incorporated therein.

Mr. JUNKERSFELD.—I would like to call Mr. Talbot's attention to the fact that my motion, as I recall it—and the records will show it—was to the effect that this report and the seven amendments attached thereto be adopted. I have no particular objection to his motion, and will be very glad to second it if he will—

Mr. CHESTER. (Interrupting).—There was a motion before the house.

THE PRESIDENT.—Your motion was not seconded, Mr. Chester.

E. R. CHAMBLIN, M. AM. SOC. C. E.—Mr. President and gentlemen: It has been suggested that a change of that sort might cause a defeat of these amendments. That would seem to imply that District No. 1 would cause their defeat, if these foreign members were allocated to all districts, or some other disposition of them were made. In fairness to many of the members who live in that District, I do not believe that they would go to that extreme to retain a slight change. On the other hand, there are many other members scattered throughout the United States who have not the privilege of attending this meeting to-day.

In reading that article as recommended by the Committee, I considered it very unfair, and I believe that if it goes out as printed it would be more apt to cause defeat than with the correction that Mr. Chester has proposed. I believe that one other serious error has been pointed out by Mr. Talbot, and acknowledged by the Committee, and that it would be the magnanimous thing for the Committee to accede to this correction. It certainly seems to me to be a fair one. I do not believe that this additional five hundred or one thousand foreign members are needed to support any measure that is fair and right.

I think that the New York members can rely on just treatment by the Corporate Members throughout these United States, and I do not believe that, if it is properly presented to them, that they would feel like insisting to a great degree on their proposed change.

F. E. ESTES, M. AM. SOC. C. E.—Mr. President, I just want to say that a blunderbus is a mighty good instrument to have sometimes. There has been submitted to the meeting by the Committee these seven amendments, and one gentleman wants another amendment, or something stricken out. We cannot get anywhere in this way. We have a motion—I do not recall by whom, but by somebody—to adopt the seven amendments recommended by the Committee. Talk about the allocation of members outside of the United States is absolutely out of order; it has nothing to do with the question before the meeting. After this

meeting decides what it is going to do with the seven amendments, if somebody else wants to strike in and divide North America into seven sections, we can handle that, but now there is only one question, and that is: What are we going to do with those seven amendments? I, for one, am in favor of accepting them.

THE PRESIDENT.—Gentlemen, we have before us the disposition of those seven amendments, and I understand that Mr. Chester's amendment applies to the seven amendments offered by the Committee.

MR. CHESTER.—It may be that my motion is out of order, if you rule that the motion to accept this Constitution is before the house.

THE PRESIDENT.—That motion is before the house.

MR. CHESTER.—The motion to accept this Constitution, or the motion to accept the amendments, is before the house?

THE PRESIDENT.—The amendments.

MR. CHESTER.—Then, I am not parliamentary enough to know just how to get my motion in order, but mine was: That it is the sense of this meeting—

THE PRESIDENT. (Interrupting).—Permit me, Mr. Chester, to say, that after these amendments are acted on there can be further amendments offered.

MR. CHESTER.—My motion was offered in the form that it is the sense of this meeting to request the Committee to include the dropping of this entire sentence, so as to make it the eighth amendment.

A MEMBER.—That would be an amendment to an amendment.

THE PRESIDENT.—Yes, sir. It is a request to the Committee to include this in their motion?

MR. CHESTER.—Yes, sir; to drop the last words of the first paragraph of Section 1, Article VII, which reads: "Members not residing in North America shall be allocated to District No. 1"—that the Convention request the Committee to incorporate that, and that it is the sense of the meeting.

THE PRESIDENT.—That is a matter for the Committee, and I think its members will have to decide it.

A MEMBER.—The motion was that it is the sense of this body that the Committee be requested to incorporate or include the said amendment.

MR. CHESTER.—I offer it as an amendment to the amendment, if you wish to make it legal or parliamentary.

MR. GRUNSKY.—Mr. President, the form in which the motion is put, I think, is out of order. The motion before the meeting at this time is on the adoption of the report of our Committee, and that includes seven amendments which the Committee has recommended. Now, that will not debar any one from suggesting that this Committee adopt additional amendments that may be appropriate, or it will not debar any member from offering amendments to the Constitution as proposed. I think we will proceed in the most orderly fashion if we dispose of the pending motion, that the seven amendments be adopted.

THE PRESIDENT.—It has been suggested that a vote be taken on the motion that the report of the Committee be received and that the seven amendments it proposes be adopted. Are you ready for the question?

MR. TALBOT.—I would like to see that motion put in this form: That the amendment proposed by Mr. Junkersfeld and seven others be amended by incorporating in that proposed amendment these proposed amendments reported by

this Committee to-day. It seems to me that if we get it in that form, it will be separated.

THE PRESIDENT.—Is the Committee prepared to accept that?

MR. JUNKERSFELD.—In order to clarify the matter, if Mr. Talbot will make his motion a substitute for mine, I will second the substitute.

THE PRESIDENT.—Mr. Talbot, do you make that as a substitute motion?

MR. TALBOT.—I do not understand that this amendment will be proper in that form, because we are not discussing this amendment. We are discussing the report of the Committee.

THE PRESIDENT.—That is right.

MR. TALBOT.—And if the Society prefers to accept the report of the Committee, then take up the proposed Constitution, I am willing to do it; but it seems to me that sometime during the proceedings we should have a motion of the kind I have just made.

MR. JUNKERSFELD.—I understand that Mr. Talbot makes that as a substitute motion, namely, to adopt the seven amendments. I second that motion, and give notice that immediately after the vote I will make a motion then to adopt the report. I second Mr. Talbot's motion.

#### PROPOSED SEVEN AMENDMENTS ADOPTED.

THE PRESIDENT.—Gentlemen, you have heard the motion. Is there any further discussion? All of those in favor of the motion say "aye"; all those opposed "no." The "ayes" have it, and the motion is carried.

MR. JUNKERSFELD.—I now move that the report of the Committee as presented just before adjournment be adopted.

THE PRESIDENT.—Omitting the part with reference to resolutions?

MR. JUNKERSFELD.—Yes, sir; I do not refer to that. I am only referring now to the report, having just been adopted.

THE PRESIDENT.—Will you read the report?

MR. JUNKERSFELD.—The report presented just before noon?

THE PRESIDENT.—Yes, sir.

MR. JUNKERSFELD.—I read that report just before noon.

THE PRESIDENT.—Some of the members have asked that it be read again.

MR. JUNKERSFELD.—Shall I read it again?

MR. NAGLE.—I call for a point of order, Mr. President.

THE PRESIDENT.—No, sir; there is no point of order in this.

MR. NAGLE.—Then the motion would appear on the original motion, as amended.

THE PRESIDENT.—Yes, sir; on the original motion, as amended.

MR. JUNKERSFELD.—I will now read the same report, omitting reference to these seven amendments that were covered by Mr. Talbot's substitute motion.

(Reads the report again.)

#### DISCUSSION ON DISCHARGE OF COMMITTEE.

THE PRESIDENT.—The motion is, that the report be received and the Committee discharged. Is there any discussion?

MR. DAVIS.—Mr. President, I would like to ask the Committee to withdraw from that motion the request for discharge. I do not know how this is coming out, and we can discharge the Committee later, after we get through with it.

MR. ESTES.—Mr. President, I believe that it would be a good thing to get the Committee to withdraw the request to be discharged, because its members are more familiar with these questions than any one else, and I believe that they will have quite a number of questions to answer before the amended Constitution is carried, and it is not a good idea to discard the men who have been guiding things.

MR. NORCROSS.—Mr. President and gentlemen of the Society: "Them kind words" is the first we have received. Your Committee feels that it has done its duty. Your Committee has been accused of every crime under the sun. (Laughter.) To-day is the first ray of hope in our dark lives, and I, for one, wish to reiterate what our Chairman has said. I wish to be discharged. (Laughter.)

MR. WILLIAMS.—Mr. President, I think that this motion of the Committee at this time is a little bit inopportune. I think that it would be very much better if the members would postpone it until we have had an opportunity to consider the remainder of the Constitution; then it will be entirely in order to make such motion, and it undoubtedly will receive the support of this gathering. I think, however, that there are one or two points in the Constitution that we should at least discuss. Now, possibly, we do not want to change it, but I think we should know, or at least have an opportunity of understanding just what certain provisions lead to. I am not presenting, nor am I going to present, any changes. There are one or two things, however, that should at least be thought about, and I want to ask that the Committee withdraw this motion for the present and let it come up at a time when we have finished consideration of this Constitution.

MR. TALBOT.—I move that the request of the Committee to be discharged, be postponed.

MR. CHESTER.—I second that motion.

MR. TALBOT.—That is a personal request—we just postpone the action.

MR. CHESTER.—I was going to move that we drop the words "and the Committee be discharged".

MR. COLEMAN.—I second the motion.

THE PRESIDENT.—It is moved and seconded that the words "and the Committee be discharged" be stricken from the previous motion. All of those in favor, say "aye"; those opposed, "no". The "ayes" have it.

Gentlemen, the motion now is on the preceding question.

#### MOTION TO POSTPONE ACCEPTANCE OF REPORT.

MR. WILLIAMS.—I move that action on the report of the Committee be deferred until we have finished the consideration of the Constitution.

J. S. CONWAY, M. AM. SOC. C. E.—I second the motion.

MR. WILLIAMS.—As I understand it, the Committee has brought in a report in which its members ask this meeting to endorse the Constitution which they have presented, and to discharge the Committee. My contention is that we should not take action until we have considered the remainder of the Constitution, and my proposal is that we postpone the consideration of that motion, and everything else,



until we have considered the Constitution. I therefore move that the consideration of the report recommending that this Constitution be approved and the Committee be discharged be postponed until we are through considering the Constitution. The adoption of that report at this time shows—

MR. NORCROSS.—(Interrupting.)—Let me explain—

THE PRESIDENT.—You have heard the motion of Mr. Williams, as just stated.

MR. COLEMAN.—Mr. President, may I be heard? I understand from Mr. Williams' motion that he is fearful that the adoption of this report which has been submitted by the Committee would bind the meeting to refrain from any further discussion of the Constitution or amendments. Frankly speaking, that would be my understanding of it, and I doubt if the Committee cares to discuss the Constitution any further or offer other amendments for the consideration of this meeting. I do not see any reason why it should do so, so far as I am concerned—and I have been laboring on this matter perhaps six months—and I think that the other members of the Committee feel the same way about it. I, therefore, would like to second Mr. Williams' motion.

H. B. LIVINGSTON, ASSOC. M. AM. SOC. C. E.—I want to raise a point of order. My recollection is that there was a motion before the house and there was an amendment to that motion, and the amendment carried, and that that motion is still before the house.

THE PRESIDENT.—No, sir. Mr. Williams has stated his motion. All of those in favor of Mr. Williams' motion, please say "aye"; those opposed, "no." It appears to the Chair that the "ayes" are in the majority. If no division is called for, I will declare the "ayes" to be in the majority, and that the action on the report be postponed until after the discussion of the proposed Constitution.

#### DISCUSSION ON PROPOSED CONSTITUTION.

MR. WILLIAMS.—I wish to call attention now to the reading of the second paragraph of Section 9 of Article VII, on page 9, which reads: "No count or listing of votes cast in any Society canvass or election shall be permitted until after the polls are closed, and then only by the officially appointed committee or the Tellers."

If I understand that wording right, it means that no listing could be kept of the members who have cast their votes. It, of course, means that no count of the votes can be made, but I think that it really means that no list can be kept. If that be the interpretation, I want to call your attention to what the result will be: Officially, legally, under the Constitution, no record can be kept of the members who have voted, as the votes come in. Consequently, theoretically, that information will be available to nobody. There is however, nothing there to prevent, after all, the Secretary, or any employee of the Society who sees those ballots as they come in, from keeping a memorandum of those who have voted.

Now, what is the result? It puts in the hands of the Secretary of the Society, or of some interested member of the Society who may secure the assistance of some employee of the Society who has the handling of the votes as they come in—which you know are marked on the outside of the envelope with the name of the member who voted—it makes it possible for the Secretary or some other member of the Society to get that record. Now, what can happen? Let us assume that it is a question in which members in one locality are on one

side and members somewhere else are on another side; and as these votes come in, perhaps, a large number from Texas, a large number from Southern California, a large number from Illinois and Pennsylvania, and so on, the person who has that information knows pretty well how that thing is going. If there are more votes coming from a region which is known to be opposed to the side he is interested in, or if they come from a region which is known to be in favor of that side, he then is able to get the information as to who has not voted in each district, and he is able to get at those votes.

Now, I hold that there is nothing criminal in this, provided everybody can do it. When, however, by our Constitution, we prohibit things which can be done clandestinely nevertheless, and any one is put in possession of this information, it affords him a weapon, and I say that it is not a desirable provision in the Constitution. It is not necessary to say what will happen. A person interested in a question can call up some of his friends who have large numbers of engineers in their employ—one who has twenty-five or thirty or seventy-five in his office who have not voted—he can get him to send their names. It has been done. It will be done again. Now, the only way to circumvent this is to arrange so that all will have access to this information, and, therefore, to provide that a record of those who have voted shall be kept, that record to be open to any one who goes to the Society to ask for it.

#### MOTION TO AMEND PROCEDURE PROVIDED FOR LISTING OF BALLOTS.

This is not a question that has come up before, I know, and I wish now to move the following amendment to substitute for the first three lines of the second paragraph of Section 9 of Article VII, beginning with "no count" and ending with the words "or the Tellers" the following: "In every election, a letter-ballot of the Society and the names of those voting shall be listed by Districts as received, and such list shall be accessible for examination at Society Headquarters by any member of the Society."

I move that as a substitute, and I may say that I have not arranged with anybody to second it.

THE PRESIDENT.—We have the motion of Mr. Williams. Is there any second?

MR. TALBOT.—I second the motion.

MR. HUMPHREY.—I also second the motion.

THE PRESIDENT.—The motion is seconded by both Mr. Talbot and Mr. Humphrey.

MR. JUNKERSFELD.—Mr. President, I will explain briefly the reasons why the Committee adopted this second paragraph of Article VII, to which Mr. Williams has reference—the second paragraph in Section 9, Article VII, page 9. As written: "No count or listing of votes cast in any Society canvass or election shall be permitted until after the polls are closed, and then only by the officially appointed Committee or the Tellers." Previous procedure has been open to abuse, and the Committee had received such a large number of suggestions on the subject that it feels justified in making the change. Now, it is true that even with this change there may be some abuse, as Mr. Williams has pointed out; but I do not know, and I do not believe anybody else does, how to devise a system of balloting that is not subject to some abuse. In a business matter, you do not place the

responsibility for taking care of the cash drawer with half a dozen people; you have to trust some one with it. Now, the other Societies, in their experience, have trusted one man, who, of course, keeps track of the ballots in his own way, and if he wishes to abuse it, he can; and it was believed that this was better than the past system of this Society which has been subject to more abuses than the system which we advocate. These, briefly, are the reasons.

THE ACTING SECRETARY.—Mr. President, I rise to a question of personal privilege, and would inquire whether Mr. Williams and Mr. Junkersfeld intend to reflect on the conduct of the Secretary's office?

MR. WILLIAMS.—No, sir.

MR. JUNKERSFELD.—No, sir; nor I.

#### PAST PROCEDURE IN LISTING BALLOTS.

THE ACTING SECRETARY.—The Secretary's office, in keeping count of the ballots, has acted in accordance with the provisions of the present Constitution, contained in Article VII, Section 6, second paragraph, which reads as follows: "The Secretary shall make a list of the voters from whom ballots are received, which list shall be open to inspection by all Corporate Members. A voter may withdraw his ballot and may substitute another at any time before the polls close."

Now, I wish to state that during the time of receiving ballots on any question, the procedure of the Secretary's office, in so far as I am acquainted with it (and I have been Acting Secretary since January 28th, 1920), has always been to keep in the office and available to the membership a list of all Corporate Members who are entitled to vote on the questions. When ballots are received, the name of the member voting is checked off of this list. Any member coming into the office can inspect the list and can make for himself other lists if he chooses, which will indicate to him who and how many have voted and who and how many have not. But it has not been the practice of the Secretary to send these lists outside. All information received by the members must be obtained through personal visit to the office.

I wish to make this statement to remove any thought that the procedure of the Secretary's office is in violation of the Constitution, or that it is the practice of the Secretary to keep the records in such a way as to be other than impartial to all members of the Society.

MR. WILLIAMS.—Mr. President, I want to say very emphatically that any remarks that I made were not intended in any wise to criticize the action of the Secretary, because I knew that he was acting under the direction of the Board and in accordance with the Constitution. Under the new Constitution, he could not keep such a list. Now, I think that it should be kept, for the reason that if it is not kept officially, it is kept privately. If kept privately, the person who keeps it has the advantage, and anybody can use it. I do not suppose that that record would be sent out to the members, or anything of that sort. It should be open to inspection at Headquarters.

MR. SANDS.—Mr. President and gentlemen: I am rather inclined to believe that I favor the amendment made by Mr. Williams. I do not know that I do, because I have not given it enough thought. It is a matter of policy that should require some thought in order to reach a decision that is based on mature judg-

ment. But I will have to vote against Mr. Williams' amendment just for this reason: That I have been one of the many living in the West who for years have wanted to see the organic law of the American Society of Civil Engineers changed, and I believe that we have now the basis of a new Constitution that will give us what we want. To use an old and homely expression that all of you Texans will understand—and if any of you who live out of Texas do not understand and will ask us, we will tell you—at this time we do not want to “gum up the cards.” We feel that we want to get through the best that we can, and that the proposed Constitution that has been offered and sent to us is a good one, but I am not sure that six months later I will not want to sign a proposed amendment that somebody offers doing the very thing that Mr. Williams wants to do at this time. I do not want to do it now, however, because I want to get this organic law changed, and I am afraid that putting Mr. Williams' amendment in at this time might defeat that. So I am going to oppose every amendment that is offered and try to get this new Constitution adopted.

MR. BUTLER.—Mr. Chairman and gentlemen: In traveling across this country I am impressed more and more by the size of the land in which we are living, and it is only when this one bobs up and that one bobs up that we have new ideas, and as we are surrounded by different environments, we naturally expect new ideas to grow. But if we are going to adopt any kind of a Constitution we must use team work, and not do individual playing. You have got to do that on a football team; you have got to do it in every organization. If our forefathers, when they adopted the Constitution of the United States, or drafted it, had waited for everybody in the thirteen colonies to be satisfied with what they had drafted, we would yet be without a Constitution of the United States. We cannot sidetrack it for every little idea that we all may have. I have them, myself, as other members have expressed themselves. I have ideas, but I am willing to subject my personal opinions to the will of the Committee, or the will of the membership here, in order to get the Constitution into working shape before the members.

I am speaking for the Spokane Section, and its last injunction to me before I left was, so far as I possibly could, to let nothing stand in the way of adopting the Constitution as it was submitted, for fear that something would come up to upset the whole proposition.

E. C. H. BANTEL, ASSOC. M. AM. SOC. C. E.—Mr. President, it seems to me that Mr. Williams is unnecessarily alarmed. If I read this paragraph correctly, it says: “No count or listing of votes in any Society canvass or election shall be permitted until after the polls are closed.” Now, a vote is not a voter, and if the Secretary desires to count the listing of the voters, there is nothing in this that prevents it. (Laughter.) Therefore, Mr. Williams, I think, is unnecessarily alarmed. If the Committee has, by this paragraph, attempted to prevent the counting of voters, it seems to me that it has failed to do so.

THE PRESIDENT.—Is there any further discussion?

GEORGE H. GUERDRUM, ASSOC. M. AM. SOC. C. E.—Mr. President, I will ask for some information. I am thoroughly in sympathy with the idea that the vote should be strictly on the merits of the proposed Constitution as it now stands. However, sitting in the back part of the room, I did not get clearly in mind this notation on page 7, Article VII, Section 3.



A MEMBER.—The question is out of order.

THE PRESIDENT.—Mr. Guerdum, the question under discussion is on the motion of Mr. Williams. We will take up this matter of yours after that is disposed of. Is there any further discussion on that motion?

C. T. BARTLETT, M. AM. SOC. C. E.—Mr. President, I would like to say just a word or two. I have the same feeling that Mr. Sands and the gentleman from Spokane have about putting the amendment through, but there has been some discussion on the merits of this second paragraph of Section 9. It seems to me that there are two things covered by that as it stands: One is that there would be no listing of the names of those who had voted, and the second that it would prevent a count of how those men had voted—in other words, the opening of the ballots.

Now, it would seem to me, as with the preceding speaker, that the amendment as offered, as I understood it when read, would not prevent the listing of the manner in which each man voted, and that, I think, would be even more objectionable than the possible listing of the names.

THE PRESIDENT.—Is there any further discussion, gentlemen?

(The question is called for.)

#### MR. WILLIAMS' MOTION IS LOST.

THE PRESIDENT.—All in favor of the motion made by Mr. Williams will signify by saying "aye"; contrary "no." The "noes" appear to have it, and the motion is lost.

MR. CHESTER.—Mr. President, before we leave this section, keeping in mind what I have said, it is my desire, and it is not the purport of this motion that this Constitution be put before the membership except as the work of the Committee on Referred Amendments. To that end, and that we may have the co-operation heretofore sought, I move that it is the sense of this meeting, that the same Committee or individuals who moved the previous seven amendments to the original draft of this Constitution, move another amendment which will drop from said Constitution the last sentence of the first paragraph of Article VII, which reads: "Members not residing in North America shall be allocated to District No. 1."

I understand that simply by a vote on this motion we request them to do this. They can then do as they please.

MR. TAYLOR.—Mr. President, that motion, I think, has come up in about six forms in different shapes, in different aspects. We had it from the Northeast, Southeast, Northwest and Southwest. The motion simply means that we instruct the Committee to adopt something to which every man on it may be opposed. Now, the gentleman can move to amend by striking that sentence out. When that is done, it is no longer the work of the Committee. After we get through with this report it is our report, as I understand it, in Convention assembled. When we send this out to the voting Corporate Members we no longer want to send it out as a report of the Committee. We are going to discharge that Committee, but we want to operate with it here a little longer. We find its members good, decent people, and as soon as we get through with them we will relieve them, but when we send this out we want to send it to the members of the Society as the recommendation of this Convention. With that end in view, I will vote against

instructing the Committee to do something. I am willing to vote on the merits of the proposal. When we get through we want to move to adopt this report as a whole, and send it out as our work.

THE PRESIDENT.—Are there any discussions on the motion? If not, all in favor signify by saying "aye"; those opposed "no". The motion is defeated.

MR. GUERDRUM.—The President informs me that at this time I am not out of order. Now, I want to say, as I said before, that I am thoroughly in favor of voting on this proposed new Constitution strictly on its merits. I want to bring up the question of typographical errors, and as a matter of information I am merely asking whether on page 7, Article VII, Section 3 should read Section 3 or Section 4, and if it is in error what should we do with it?

THE PRESIDENT.—Any further discussions on the amendments to the Constitution?

#### CONVENTION ADOPTS PROPOSED NEW CONSTITUTION.

MR. TAYLOR.—I move that we adopt the proposed revised Constitution, with the amendments—the whole Constitution.

J. B. HAWLEY, M. AM. SOC. C. E.—I second the motion.

THE PRESIDENT.—It is moved and seconded that the Convention adopt the whole Constitution. All in favor say "aye"; those opposed "no". It is carried unanimously.

MR. HIDINGER.—Mr. President, I move that the report of the Committee as read by Mr. Junkersfeld be approved.

MR. WILLIAMS.—I support that motion.

THE PRESIDENT.—It is moved and seconded that the report of the Committee now be approved. All those in favor say "aye"; those opposed "no". The report is adopted.

MR. WILLIAMS.—I would like to ask that the Board of Direction be instructed to inquire from our counsel by what authority this Committee reported on By-Laws. So far as I am aware, the subject of By-Laws was not referred to this Committee, and the subject of By-Laws does not appear in the Constitution of the Society, and I think it may be well to have legal opinion as to whether what it has produced here is a legal document.

MR. HIDINGER.—Answering Mr. Williams' question, I want to say this question was thoroughly gone into with Mr. Baker, of the Society's counsel, and he approved it, and said we were entirely within our rights to separate the existing Constitution into a new Constitution and By-Laws.

THE PRESIDENT.—Is there any further business to come before the Convention?

MR. TALBOT.—I move that we adopt the By-Laws as offered here and printed.

A MEMBER.—I second the motion.

THE PRESIDENT.—It has been moved and seconded that the Convention adopt the By-Laws as printed. All those in favor indicate it by saying "aye"; those opposed "no". The "ayes" have it, and it is so ordered.

MR. HIDINGER.—Mr. President, I move that the Committee on Referred Amendments be discharged.

MR. TAYLOR.—I second the motion.

THE PRESIDENT.—It is moved and seconded that the Committee on Referred Amendments be discharged. Any discussion? All those in favor of that motion

indicate by saying "aye"; those opposed "no". The "ayes" appear to have it, and it is so ordered.

MR. TALBOT.—Mr. President, I move that the Society, in Convention assembled, thank the Committee for its very excellent work.

MR. WILLIAMS.—I second the motion.

THE PRESIDENT.—It is moved and seconded that the thanks of the Society be extended to the Committee for its very efficient work. We will indicate that by a rising vote.

(The motion was carried unanimously.)

Is there any further business to come before the Convention? Mr. Crocker, have you any announcements to make?

THE ACTING SECRETARY.—One of the members wishes to make an announcement of a trip.

(Several announcements of excursions followed.)

MR. WILLIAMS.—Mr. President, this is the last time we will be gathered together here officially during this Convention, and I think it would be quite proper to express our gratitude to the Local Committee and to the members of the Society in Texas who have done so much to make our stay pleasant and enjoyable. I move that a committee of three\* be appointed by the Chair and authorized to prepare suitable resolutions† with power to provide for transmission to the Local Committee.

MR. DAVIS.—I second the motion.

THE PRESIDENT.—Gentlemen, you have heard the motion. All those in favor say "aye"; those opposed "no".

(The motion was carried by a standing vote.)

MR. TAYLOR.—Mr. President, I wish now to extend an invitation to the members who are here with us in Texas, that any of you who possibly can, make a side trip and come to Austin, and we will be glad to show you what we have there—our engineering office, reinforced concrete bridge, our capitol. We have there the greatest comedy and the greatest tragedy that was ever put on any stage in America. We have there a dam that as far as engineering design is concerned is the greatest comedy that was ever perpetrated in America; as far as the people are concerned—they pay the freight—it is the greatest tragedy. Any of you who can return home by way of Austin, Tex., although I know it is out of your way, if you will let us know we will extend to you a glad welcome, and not only put the latchstring on the outside of the door, but we will take the door off the hinges. (Applause and laughter.)

THE PRESIDENT.—Is there any further business to come before the Convention?

(On motion, duly seconded, the Convention then adjourned.)

\* Subsequently, President Webster appointed Messrs. Gardner S. Williams, Chairman, H. S. Crocker, and Arthur N. Talbot, Members, Am. Soc. C. E.

† See p. 507.

## FIFTY-FIRST ANNUAL CONVENTION EXCURSIONS AND ENTERTAINMENTS

The arrangements for the Convention were in the hands of the following Committees:

### Committee of Arrangements of the Board of Direction

George G. Anderson, *Chairman*,

Edward E. Wall,

Frank T. Darrow.

### Local Committee

E. B. Cushing, *Chairman*,

J. H. Brillhart

R. J. Cummins

E. A. Fretz

J. M. Howe

H. F. Jonas

E. G. Maclay

J. C. McVea

W. H. Mead

L. T. Peden

E. E. Sands

M. J. Sullivan

J. B. Townsend.

### Ladies' Automobile Trip and Luncheon

*Wednesday, April 27th, 1921.—11 A. M.*—The visiting ladies were the guests of the Ladies' Auxiliary Committee at a picnic luncheon at Hermann Park, which was followed by an automobile ride through the city. The entertainment was attended by about 65 ladies.

### Reception

*Wednesday, April 27th.—9 P. M.*—A reception tendered by the Local Membership and attended by about 260 members and guests, was held in the Green Room of the Rice Hotel, followed by dancing in the Ball Room.

### Houston Ship Channel Trip

*Thursday, April 28th.—9 A. M.*—Members and guests to the number of 330 went by special train to Houston Harbor, about 4 miles from the center of the city, where they inspected the Municipal Docks and Terminals. At 10.30 A. M. the party embarked on boats and proceeded down the Houston Ship Channel, viewing the industries, etc., *en route*. About noon the party debarked at the San Jacinto Battlefield, where a Texas ranch barbecue dinner was served. Several impromptu talks were made, followed by an interesting address by Mr. C. R. Wharton, of Houston, a relative of one of Gen. Sam Houston's officers in the battle which took place here in 1836, by which the independence of Texas from Mexico was achieved. After walking over the Battlefield (now a State park), the party re-embarked and proceeded down the Ship Channel. Passing close to the Goose Creek oil field and the Dock and Pipe Line Terminals of the Humble Oil and Refining Company, the vessels proceeded from the Inland to the Open Waterway Section of the Ship Channel and landed at Sylvan Beach Park, where the party took the train for the return trip to Houston.

### Concert

*Thursday, April 27th.—8.30 P. M.*—A concert was given in the Ball Room of the Rice Hotel, one of the features of which was the performance of the Juvenile



Band, composed of children from 4 to 8 years of age. The International Kiwanis Glee Club also took part in the entertainment. The Concert was followed by dancing and was attended by about 240 members and guests.

#### **Excursion to Points of Engineering Interest**

*Friday, April 29th.—9 A. M.*—A party of about 137 members and guests left the Union Terminal Station by special train over the Municipal Harbor Belt Railway and visited the plants of the Anderson-Clayton Compress and Warehouse, the Magnolia Products, the National Creosote and Lumber Company, and the Southern Motor Manufacturing Association. About 1 P. M. a luncheon, tendered by the Texas Portland Cement Company, was served at its plant on the Houston Ship Channel and the Harbor Municipal Belt Railroad. After the luncheon, the party was divided into two groups, those interested in Railway Engineering visiting the Wood Preserving Plant, the Englewood Terminal, and the General Shops of the Southern Pacific Lines, and the second group, those interested in Municipal Works, was taken to the Water-Works and the Sewage Disposal Plant, after which the entire party went to Rice Institute.

#### **Reception and Garden Party at Rice Institute**

*Friday, April 29th.—5 P. M.*—Members and guests left the Rice Hotel for an automobile ride through the residential section of the city, uniting with the Inspection Parties at the William M. Rice Institute, where an address of welcome was made by Dr. Edgar Odell Lovett, President of the Institute. A reception and garden party on the lawn followed, which was attended by about 200 members and guests.

#### **Smoker**

*Friday, April 29th.—8.30 P. M.*—About 375 members and guests attended a Smoker tendered by the Houston Engineering Club, on the roof of the Rice Hotel, the entertainment consisting of music by a Mexican orchestra, vocal numbers and recitations by the students of the Houston (Negro) College, moving pictures of operations in the oil fields, and other interesting features.

#### **Excursion to Galveston, Tex.**

*Saturday, April 30th.—8.30 A. M.*—A party of 165 members and guests left Houston by special train on the Galveston Houston Electric Railway and arrived at the Galveston Causeway about 10 A. M., where they were joined by 35 members and guests who had come by automobile from Houston and Galveston. The work in progress on the Causeway, as well as the completed parts, was inspected until 11 A. M., when the party proceeded to Galveston where it was met by members of the Citizens' Reception Committee and taken by boat for a trip along the waterfront, during which luncheon was served. After inspecting the Galveston Dry Dock, the party boarded the sea-going dredge, *Galveston*, and through the courtesy of Maj.-Gen. Lansing H. Beach, Chief of Engineers, U. S. A., and Maj. L. M. Adams, Corps of Engineers, U. S. A., Engineer of the Galveston District, both of whom were present, a demonstration was made of this dredge in operation. On their return to the city, the members of the party were taken on trolley cars to the beach, where they spent about two hours.

### Dinner at the Galvez Hotel

*Saturday, April 30th.—7 P. M.*—A party numbering 227 members and guests was entertained at a Sea Food Dinner at the Galvez Hotel, as guests of the Galveston Commercial Association, which had also acted as host at the other entertainments on Galveston Island. The party left Galveston at 9.45 P. M., on a special interurban train, arriving at Houston at 11.15 P. M.

### Letters of Appreciation

The following letters of appreciation were prepared and forwarded to the Local Committees in charge:

"April 29th, 1921.

"TO THE LOCAL COMMITTEE OF THE  
FIFTY-FIRST ANNUAL CONVENTION OF THE  
AMERICAN SOCIETY OF CIVIL ENGINEERS:

"GENTLEMEN.—On behalf of and by instructions from the Fifty-first Annual Convention of the American Society of Civil Engineers, we have the honor to transmit to you, and through you to the Texas members, your ladies, and your fellow townsmen, the deep appreciation of your guests for the wonderful cordiality and lavish hospitality with which they have been entertained in your own and your neighboring city, and we express the sincere hope that from our all too brief association with you may come a better understanding between the members of our organization in the several sections of the country here represented, and closer co-operation in promoting the objects of the Society in which we have so great a pride of membership.

"GARDNER" S. WILLIAMS, *Chairman,*  
"A. N. TALBOT,  
"HERBERT S. CROCKER,  
*Committee."*

"April 29th, 1921.

"TO THE LADIES' ENTERTAINMENT COMMITTEE  
OF THE FIFTY-FIRST ANNUAL CONVENTION OF THE  
AMERICAN SOCIETY OF CIVIL ENGINEERS:

"The visiting ladies attending the Fifty-first Annual Convention of the American Society of Civil Engineers wish to express to you their high appreciation of the splendid entertainment which you have provided during their stay in your city.

"Your cordial welcome has been so warm and sincere that from the moment of their arrival they could not but feel themselves among friends.

"The beautiful floral tributes which have been sent daily to our rooms have been greatly enjoyed and the pleasure of the time spent with you will be long remembered.

"On behalf of the visiting ladies, we wish to sincerely thank you for your generous hospitality.

"MARY H. WEBSTER,  
"EDNA L. CROCKER."

### ATTENDANCE

The following 173 Members of the Society were in attendance. There were also present 80 ladies and guests.

Anderson, George G...Los Angeles, Cal. Ash, L. R.....Kansas City, Mo.  
Armstrong, W. C.....St. Paul, Minn. Axtell, F. F.....Port Arthur, Tex.

Ayres, L. E.....	Ann Arbor, Mich.	Edwards, G. G.....	Ennis, Tex.
Babb, Charles S.....	Chicago, Ill.	Eliot, W. M.....	Dallas, Tex.
Bantel, E. C. H.....	Austin, Tex.	Ellsworth, C. E.....	Austin, Tex.
Bartlett, C. Terrell..	San Antonio, Tex.	Elrod, H. E.....	Dallas, Tex.
Beach, Lansing H....	Washington, D. C.	Estes, Frank E.....	Shreveport, La.
Beahan, Willard.....	Cleveland, Ohio	Fauntleroy, J. D.....	Fort Worth, Tex.
Bell, Tyree L., Jr.....	Dallas, Tex.	Finch, S. P.....	Austin, Tex.
Bernard, Merrill M.....	Crowley, La.	Fischer, W. A.....	Fort Worth, Tex.
Bird, Byron.....	College Station, Tex.	Frederickson, J. H....	Houston, Tex.
Black, C. N.....	Houston, Tex.	Fretz, E. A.....	Houston, Tex.
Brandt, Richard L....	San Antonio, Tex.	Friend, F. F.....	Columbus, Ohio
Brillhart, J. H.....	Dallas, Tex.	Galbreath, A. W.....	Parsons, Kans.
Bringhurst, J. H.....	Stillwater, Okla.	Gallagher, H. M.....	New Orleans, La.
Brown, Baxter L.....	St. Louis, Mo.	Glenn, R. V.....	Fort Worth, Tex.
Burney, R. L.....	San Antonio, Tex.	Grunsky, C. E.....	San Francisco, Cal.
Butler, A. D.....	Spokane, Wash.	Guerdrum, G. H.....	Kelly Field, Tex.
Byrne, T. S.....	Fort Worth, Tex.	Gustafson, E. N.....	Bay City, Tex.
Carrington, H.....	Tampico, Mexico	Harding, Robert J....	San Antonio, Tex.
Carter, C. R.....	Houston, Tex.	Harshbarger, E. L.....	Houston, Tex.
Chamberlin, C. H....	Fort Worth, Tex.	Hawley, John B.....	Fort Worth, Tex.
Chamblin, E. R.....	Dallas, Tex.	Hedrick, W. C.....	Dallas, Tex.
Chester, J. N.....	Pittsburgh, Pa.	Helland, Hans.....	San Antonio, Tex.
Clack, J. M.....	New Orleans, La.	Helland, H. R. F....	Waxahachie, Tex.
Clark, Charles A.....	Dallas, Tex.	Henny, D. C.....	Portland, Ore.
Cochrane, Victor H.....	Tulsa, Okla.	Henry, E. U.....	Houston, Tex.
Coleman, E. H.....	New Orleans, La.	Hidinger, L. L.....	Memphis, Tenn.
Coleman, J. F.....	New Orleans, La.	Hollman, J. G.....	Camarasa, Spain
Comber, S. X.....	Boulogne, France	Horton, C. K.....	Beaumont, Tex.
Conway, John S.....	Washington, D. C.	Hovey, Otis E.....	New York City
Crawford, C. J.....	Tampico, Mexico	Howard, C. J.....	Corpus Christi, Tex.
Crew, C. C.....	Houston, Tex.	Howe, J. M.....	Houston, Tex.
Crocker, H. S.....	Denver, Colo.	Howes, C. P.....	Dallas, Tex.
Culpeper, Horacé.....	Houston, Tex.	Hoyt, J. C.....	Washington, D. C.
Cummings, Robert A..	Pittsburgh, Pa.	Hudson, C. W.....	New York City
Cummins, Robert J....	Houston, Tex.	Humphrey, Richard L..	Philadelphia, Pa.
Cushing, E. B.....	Houston, Tex.	Jameson, R. O.....	Dallas, Tex.
Darrow, F. T.....	Lincoln, Nebr.	Jonah, F. G.....	St. Louis, Mo.
Datz, L. C.....	Birmingham, Ala.	Jonas, H. F.....	Galveston, Tex.
Davis, A. P.....	Washington, D. C.	Jouine, G. P. F.....	Houston, Tex.
Davis, C. M.....	Fort Worth, Tex.	Jowers, G. M.....	San Antonio, Tex.
Day, J. C.....	Springfield, Mo.	Juengst, H. F.....	St. Joseph, Mo.
DeBerard, W. W.....	Chicago, Ill.	Junkersfeld, Peter.....	Boston, Mass.
Dennis, H. W.....	Los Angeles, Cal.	Kearny, C. H.....	San Antonio, Tex.
Dobson, G. C.....	Tulsa, Okla.	Kellersberger, A. C.....	Houston, Tex.
Dunlap, Robert M.....	Chicago, Ill.		

Knowles, J. H.....	Houston, Tex.	Sands, E. E.....	Houston, Tex.
Koch, O. H.....	Dallas, Tex.	Satterfield, R. P.....	Dallas, Tex.
Laboon, J. F.....	Pittsburgh, Pa.	Scherer, C. L.....	Beaumont, Tex.
Landreth, Olin H.....	New York City	Schneider, E. J.....	San Francisco, Cal.
Lange, T. F.....	New Orleans, La.	Schultz, Charles.....	McKinney, Tex.
Lansdale, John.....	Houston, Tex.	Seward, Oscar A., Jr...	Beaumont, Tex.
Lee, Don.....	Dallas, Tex.	Smith, S. M.....	St. Louis, Mo.
Livingston, H. B.....	San Benito, Tex.	Smith, T. L., Jr.....	Houston, Tex.
Love, A. C.....	Bryan, Tex.	Smith, Vernon H.....	Dallas, Tex.
Lyle, William T.....	Houston, Tex.	Stainer, M. A.....	Fort Worth, Tex.
Lytle, H. G.....	Dallas, Tex.	Stein, John B.....	New York City
Maclay, E. G.....	Houston, Tex.	Stine, W. P.....	Houston, Tex.
McClendon, W. W.....	Mineral Wells, Tex.	Stivers, A. D.....	Dallas, Tex.
McConnell, I. W.....	New York City	Struckmann, H.....	New York City
McGrew, A. B.....	Pittsburgh, Pa.	Stuart, Francis Lee....	New York City
McMenimen, W. V.....	New York City	Stubbs, L. W.....	Shreveport, La.
McVea, J. C.....	Houston, Tex.	Sullivan, M. J.....	Houston, Tex.
Mead, W. H.....	Houston, Tex.	Swope, E. E.....	Beaumont, Tex.
Miller, Paul B.....	Houston, Tex.	Talbot, A. N.....	Urbana, Ill.
Morey, E. F.....	Dallas, Tex.	Tamm, Alfred.....	Harlingen, Tex.
Mutersbaugh, A. M....	Lake Charles, La.	Taylor, T. U.....	Austin, Tex.
Myers, E. L.....	Dallas, Tex.	Thatcher, W. N.....	Houston, Tex.
Nagle, J. C.....	College Station, Tex.	Townsend, J. B.....	Houston, Tex.
Nash, J. P.....	Austin, Tex.	Tucker, James I.....	Oklahoma City, Okla.
Norcross, P. H.....	Atlanta, Ga.	Veatch, N. T., Jr....	Kansas City, Mo.
Norris, J. A.....	Austin, Tex.	von Deesten, A. P.....	Galveston, Tex.
Noyes, E. N.....	Dallas, Tex.	Von Zuben, F. J.....	Fort Worth, Tex.
O'Hearn, J. L.....	Dallas, Tex.	Wall, Edward E.....	St. Louis, Mo.
Palm, T. J.....	Waco, Tex.	Warner, F. C.....	Galveston, Tex.
Peden, L. T.....	Houston, Tex.	Washington, W. O....	Brownsville, Tex.
Pegram, George H.....	New York City	Wathen, B. S.....	Dallas, Tex.
Pew, Arthur.....	Atlanta, Ga.	Webster, George S....	Philadelphia, Pa.
Reed, R. J.....	Los Angeles, Cal.	Weymouth, F. E.....	Denver, Colo.
Richmond, Julian.....	Yonkers, N. Y.	Wheat, G. N.....	Rock Springs, Tex.
Rightor, F. E.....	San Antonio, Tex.	Wickline, G. G.....	Austin, Tex.
Roberts, H. N.....	Longview, Tex.	Williams, Gardner S...	Ann Arbor, Mich.
Rockwell, William L.....	Austin, Tex.	Williford, C. L.....	Houston, Tex.
Rogers, Edwin H.....	West Newton, Mass.	Windrow, R. J.....	Austin, Tex.
Rollins, A. P.....	Dallas, Tex.	Wise, Albert J.....	Houston, Tex.
		Witt, J. F.....	Dallas, Tex.
		Youngs, W. C.....	Livingston, Tex.



## NEW ENGINEERING IDEALS

ADDRESS BY IRL O. BAKER, M. AM. SOC. C. E., AT THE INSTALLATION OF THE  
PURDUE UNIVERSITY STUDENT CHAPTER, APRIL 5TH, 1921.

This meeting is to celebrate a new departure in the Civil Engineering Department. The innovation is chiefly significant because it is representative of new ideals recently adopted by the Engineering Profession. In the last few years there has been a rapid and radical change of attitude on the part of engineers as to the elements of education and character necessary for the highest professional success. In the early history of engineering, say a little over a generation ago, many engineers believed that it was impossible to teach in college anything valuable concerning the practice of engineering, but gradually the colleges demonstrated the falsity of this assumption, until in recent years the college graduate has nearly dominated the Engineering Profession. With the increased development of college education has crept in some unfortunate ideals, and recently there has been a general disposition of the Profession to change these standards. As evidence of this disposition, I cite four examples:

1.—A few years ago there was organized the American Association of Engineers, the purpose of which was to secure for engineers greater recognition, particularly in salary. The phenomenal growth in membership of this Association is proof that it promised to meet a long-felt need of many engineers.

2.—Until recently most of the National engineering societies had for their chief, if not their sole, aim the reading, discussion, and publication of technical papers, but recently most, if not all, of them have radically changed their purpose. Now they devote themselves also to other phases of the work of the engineer, such as his relations to financial interests, to labor problems, to governmental affairs.

3.—To carry out the new aims of the engineering societies just referred to, they have organized the Federated American Engineering Societies, the sole purpose of which is to give attention to the non-technical, or rather to the less technical, phases of engineering work. At the first meeting of the federated council, at the suggestion of its first President, Herbert C. Hoover, M. Am. Soc. C. E., it was decided that the engineers of the country should make a survey of representative industries to determine whether or not there were needless wastes, and to discover if these wastes could be eliminated. The proposition was one of wide vision and large possible benefit to this country, and even to the entire world. The first stages of this investigation are rapidly approaching completion, and give promise of fulfilling the high hopes with which the work was undertaken.

4.—In recent years, the consensus of opinion of the Engineering Profession has been that the engineer has failed to receive the recognition in society, in industry, and in Government that the time devoted to his professional preparation justifies and the importance of the matters committed to his charge demands. If the citizens of a town are called together to consider the installation of water-works or a system of sewers, the lawyer and the doctor, the preacher and the editor have been called on for their views, but seldom under such circumstances has the engineer been asked to speak to his fellow citizens, even though the subject under consideration was primarily an engineering matter. Again, engineers quite

generally complain that the salary in their profession is not commensurate with that of the lawyer, the dentist, or the doctor. Further, engineers frequently call attention to the fact that although railroad commissions and public utilities commissions deal with matters relating primarily to engineering affairs, there is seldom, or never, an engineer appointed on such commissions, or on the Interstate Commerce Commission. These facts are part of the evidence that has led engineers during the last few years to attempt radically to change the status of the Profession; and the event we celebrate to-night is one part of that great movement.

If the innovation which we here celebrate is representative of a general movement in the Engineering Profession, it is perhaps well that we should inquire whether there is any corresponding change needed in the attitude of engineering educational institutions and of engineering students toward the factors necessary for the largest usefulness and widest success of the engineer.

#### FACTORS NECESSARY FOR HIGHEST ENGINEERING SUCCESS.

What are the most important elements that contribute to the success of an engineer? They can be included under five heads, namely: (1) technical ability; (2) breadth of knowledge; (3) initiative; (4) executive ability; and (5) ability to write and speak clearly and forcefully.

1.—*Technical Ability*.—Apparently, in the past at least, the chief aim of the engineer has been to perfect himself in technical details. Many, if not most, engineering instructors have been impressed with the magnitude of the field of engineering knowledge, and have given their best effort to imparting to their students what they believed to be the technical information needed in their future work. Therefore, the chief aim of the engineering student has been naturally, and almost universally, to acquire facts about his chosen profession.

I have just intimated that by common consent engineers have agreed that one of the mistakes in the past, both in college and out, has been that of considering the sole aim of the engineer to be the acquisition of technical details; and in various ways the Profession is now seeking to overcome this handicap.

What may the engineering student do to correct this mistake? First, he must be thoroughly convinced that the mere accumulation of technical information has little or no educational value. He should never overlook the fact that the power to observe closely, to reason correctly, and to state clearly are of vastly greater importance than any amount of technical information; and he should not forget that technical details without these qualities are absolutely useless. Technical details speedily get out of date; but these qualities are never out of date, and are always valuable whatever a man does.

Of course, there must be some intellectual development in the acquisition of technical information, but the student should continually seek to get the maximum intellectual development as he acquires technical facts. He should seek to understand the relations between the facts and fundamental principles, should inquire the reasons for the particular practice, and determine whether it is general or due to some limiting condition of time or cost. He should regard his study as a test of how quickly and certainly he can acquire the significant facts from the printed page, and in reciting he should take pains to see how clearly, fully, and orderly he can state his facts. In all his work he should seek to develop and strengthen his intellectual powers rather than merely to acquire facts.

Please do not misunderstand me at this point. Of course, the engineering student must study technical matter, for that is what distinguishes the engineer from other professional men; and his study is the instrument or the means by which he develops his intellectual faculties. However, the development of the mental powers is the most vital element in an education. It alone confers that power which masters all it touches, which can adapt old forms to new uses, or create new and better means of reaching old ends; and without this power the engineer cannot hope to practice his profession with any considerable chance of success. The formation of correct habits of thinking and working, habits of observing, of classifying, of investigating, of understanding, of getting clear and distinct ideas, of proving instead of guessing, of weighing evidence, and of doing thoroughly honest work, is a method of using that power economically. The power to acquire information, and the knowledge of how to use it, is of far greater value than any number of the most useful facts. I repeat that the accumulation of facts is practically worthless.

2.—*Breadth of Knowledge.*—The second factor I mentioned as necessary for the success of an engineer is breadth of knowledge. The engineer should understand at least some of the fundamentals of economic problems, of social conditions, of political questions, of legislative action, and know something of the subtle relations of labor and capital, of the factors affecting international trade, and of other questions that form the subject of the thinking and conversation of his business associates and other professional men. If the engineer is found seriously lacking in knowledge of these subjects, the layman considers him an ignorant man.

As a rule, almost without exception, engineering students have sought to give all their time to technical matters to the exclusion of the study of such subjects as language, history, economics, political science, and sociology. An engineer must live with other men, and in his ordinary conversation he will be judged largely by the breadth of his knowledge of matters social, industrial, and financial. If an engineer in ordinary conversation has no opinion concerning the leading vital questions of the day, as, for example, the relations of labor and capital, or the new Federal law concerning water-power development, or the questions pending before the National Railroad Labor Board, then intelligent men will not be interested in cultivating his acquaintance, and will conclude that he is not a man of force or vision, and consequently his position as an engineer, as a technical man, will suffer.

What can an engineering student do to broaden his knowledge outside of technical matters? Frankly, I say not very much while in college; but while still a student he can make up his mind that these matters are important, and he can begin by giving increased attention to such discussion of these subjects as he finds in the ordinary newspapers. At first, he will get only a confused idea from such reading; but by persistent effort the leading principles will gradually emerge from the haze, and he will begin to understand something about these questions. Incidentally, such reading will be of inestimable value in teaching him to weigh evidence, to sift the wheat from the straw, and to discriminate between truth and error.

Unfortunately, most of the engineering student's work at college has to do with absolute truth, and all he has been expected to do was to accept on faith the

principles stated. But when he gets out into actual life, he will find that the principles with which he has to deal are entangled with opposing views; and it will require great insight and patience and perseverance for him to acquire that point of view which he believes to be the wise or the correct one. However, the doing of this is itself a valuable part of any man's education, and particularly of an engineering student who has devoted most of his time to the study of absolute truth.

One of the best means of broadening his horizon is to read regularly and systematically a good technical journal; but an engineering student, in addition to keeping an eye on the less transient and less ephemeral articles of a good daily paper, should also read the political or governmental or financial articles in at least one of the standard monthly magazines.

*3.—Initiative.*—The third important factor in the preparation of an engineer is initiative. The most successful engineer must have the ability to devise new solutions of an old problem, the power to discover new methods of accomplishing results, the capacity to find ways and means without waiting to be told. Without the power of initiative, the power of self-direction, no one can hope to be trusted with large responsibility. Men who are at the head of large enterprises and who carry large responsibilities are always looking for those who have initiative; and not infrequently they choose the uneducated man, or perhaps I should say the unschooled man, who has the power of initiative, in preference to the college trained man who does not have it.

The student should understand that the highest object of a college training is to cultivate his intellectual powers and to develop such habits of working and thinking as will enable him to solve old problems in new ways and to discover new and better ways of doing work. The cultivation of the power of initiative, of self-reliance, of self-direction is the most important phase of a college education. If a student has a problem which baffles him, he should not be content to lay it aside with the expectation that the instructors will explain it at the next recitation; but he should regard such a problem as a challenge to his intellectual power, to his ability to overcome obstacles, and he should earnestly, even enthusiastically, wrestle with the difficulty until he has overcome it. Not infrequently the student says that he does not have time to wrestle with such problems, but that when he has been graduated, then he will cultivate that element of his character; but, unfortunately, after the student in the formative period of his life has postponed such contests, he loses the power that would come to him through a progressive wrestling with such problems, and finally loses even the desire to accept such a challenge. The student who "side-steps" such problems in college will continue to "side-step" them in after life, and thus will lose the opportunity for the largest success, and will become virtually only "a hewer of wood and a drawer of water" in the Engineering Profession.

Let me urge upon the students here to-night to accept the highest ideals of an engineering education as the first obligation they owe to their own future success; and I beg of you that you here solemnly resolve that you will not fail to use every possible opportunity to strengthen your power of initiative and self-reliance.

*4.—Executive Ability.*—The fourth important factor in the success of an engineer is executive ability, the ability to direct the work of others. A good execu-



tive is a man of initiative and self-reliance, but he is also one who understands other men, and who knows how to secure their hearty co-operation. This requires tact, patience, perseverance, courage, the ability to judge men, a knowledge of character, and an understanding of motives. The engineer does not usually give heed to these matters, and this is at least one reason why he is seldom advanced to the higher administrative positions. Administrative officials are always looking for men who will help them to carry their load, and the pay is invariably comparatively high because such men are relatively scarce. Many high-priced positions in the engineering field are held by non-engineers because no engineer could be found with the necessary executive ability.

How may an engineering student cultivate executive ability?

One way is to attend the meetings of the Student Chapter of the American Society of Civil Engineers, and rub elbows with other civil engineering students and learn to participate in team action. Study your fellow members to learn their characteristics, their motives, their methods, their points of view. A chief factor in the success of an executive is his ability to judge men, and the Student Chapter is a good place to cultivate this important element. Of course, in a fraternity one can learn something about his fellow students and study their characteristics, but not to so great an extent as in the Student Chapter, nor learn so much about the engineering traits of their character. Some of you may think this matter one of small importance, but I beg you to remember that our lives represent the sum total of all the influences that have acted upon us; and I assure you that those with whom we associate go far to determine our own character and ambitions, and also that the study we give to those we meet is an exceedingly important part of our own education. If we hope ever to occupy an executive position of responsibility and trust, we must use every opportunity to prepare for it. The work in the recitation room is of little or no help.

A second way to cultivate executive ability is to secure an office in the Student Chapter of the American Society of Engineers, and then discharge the duties of the office in an efficient manner. If one is elected President, he can exercise his judgment in the appointment of a Programme Committee that will function effectively; and he should use his generalship to secure a good attendance. At the meeting he has an opportunity to make a graceful introduction of the speaker, and later by a question or a suggestion he can often stimulate discussion of the paper. Or, if a student is appointed Chairman of the Programme Committee, he has opportunity to discover latent talent or to explain to the reluctant contributor the advantages of activity in an engineering society.

*5.—Ability to Write and Speak.*—Fifth, and last, I come to the consideration of one of the most serious mistakes, if not the most serious of all the mistakes, engineers have made in the past. The engineer, in college and also after graduation, has been so intent upon perfecting himself in technical details that he has neglected the means of communicating his thoughts by writing or speaking to his fellow men. The engineer, if he is to attain to any considerable prominence or influence in his community, must do business with other men, must explain plans, must write letters, must prepare contracts, must give testimony in Court, must write reports; unless he has acquired the ability to express his thoughts in clear and forceful English, he cannot influence others to accept his views, or convince

others that he is an intelligent or educated man. Other men are not able to judge him by his technical attainments, but do judge him by his ability in writing and speaking. Unless he uses clear and forceful language, others are likely to assume that he is an ignorant man, and consequently his professional standing suffers and his influence as a citizen is weakened.

Usually, the engineering student is considerably weaker in his use of language than most other college students, because the engineering student's work is largely drawing, mathematics, and design, and there is but little opportunity for cultivating the use of language in such work, while in most other courses the subject matter dealt with, and the manner in dealing with it, strengthens the capacity of the student in the use of his mother tongue. Further, the drafting room and the designing room and the technical lecture consumes so much of the student's time that he has much less opportunity than his fellow students to do assigned reading, and therefore loses its widening, broadening influence.

What, then, can the engineering student do to prepare himself in this important phase of engineering education? In the first place, it is unfortunate that some engineering instructors set bad examples to engineering students in the use of language. The instructor often has for his chief aim the presentation of technical facts, and pays little or no attention to the language or to the intellectual development of those under his charge. Because this is so, and because of the nature of the college work in engineering, the student is left mostly to his own resources in cultivating this important phase of his education. But if he does not develop the ability to speak felicitously, fluently, and forcefully before he leaves college, he is doomed to mediocre success. Therefore, he should watch his language in oral recitation, in written quizzes, and in examinations, and he should be exceedingly careful that he does not develop habits of looseness and confusion in his language. He should use his letters home and to his friends as means of cultivating one of the most important elements in the education of an engineer. Further, he should regard it as a privilege to present carefully prepared papers before the Student Chapter of the American Society of Civil Engineers. Again, he should attend the meetings of this Society and participate in the discussions of the papers in order that he may acquire facility in oral expression.

Let me repeat that I am very sure one of the most serious weaknesses in the education of most engineering students is their inability to use their mother tongue reasonably well. I will go one step further, and say that I firmly believe that some engineers by their crude, confused and incorrect speech discredit all engineers, and do much to prevent the recognition of engineering as a profession. Such men are in a large degree responsible for the low pay and lack of honorable recognition of engineers.

Of the five qualifications I have discussed, the ability to write and speak clearly and forcefully is the one most easily obtained and the one that is most important in its effect on the success of the engineer. That is a pretty strong statement, but in my opinion it is strictly true.

#### ILLUSTRATION CITED.

Now let me tell one little story that illustrates two or three of the points I have attempted to make in this address, and then I am through.

A young man who had been graduated six or eight years from the civil engineering course of the University of Illinois, on the day he landed in New York on his return from military service in the World War, applied for engineering employment to a firm of bankers in New York City. He had no credentials, and no letter of introduction; but he secured employment on the spot. He was employed to make a canoe trip of 1500 miles on a Canadian river in company with a British engineer, to investigate the possibilities of hydro-electric power and industrial development. He made the trip and submitted a report which was liked so well that it was sent to London without dotting an "i" or crossing a "t"; and what is more, the firm liked the report and the man so well that it immediately put him in charge of all its interests in one of the great States of the Middle West—electric railways, electric light plants, gasworks, water-works, and what not.

Shortly after getting the second appointment the young man wrote to me and said: "Unquestionably, the report got me this position; and I feel that I owe the report to the drubbings you gave me about my English. Anyway, I wrote a report that was liked, and now I ride in Pullmans, stop at the best hotels, and am in a position to tell a good many engineers what to do."

The young man gave all the credit to his report, but let us see. Evidently in the first place he had breadth of knowledge, for he knew to whom to apply for a job and unquestionably he selected the best firm in New York City for the object he had in mind. In the second place, he certainly had a pleasing personality, good manners, and good English, qualities which must be cultivated and which cannot be assumed when needed. He had not pursued electrical engineering, nor had he had any experience in hydro-electric power development, and he had no acquaintance with Canadian rivers or Canadian industrial conditions; but somehow he was selected for the job. Doubtless during the interview he convinced the banker that he was a man of initiative, self-reliance, energy, and breadth of view. The report which he wrote evidently showed the bankers that the young man had the ability to observe closely, analyze correctly and state clearly. Further, the banker doubtless thought the qualities which the young man showed in the interview and in the report would make him a useful employee in his present position. Clearly he was employed in both positions because of his intellectual ability and personal qualities rather than because of any technical facts he had in his notebook or on the tip of his tongue. In short, he was employed because during his college course, while studying engineering, he had developed his intellectual powers and acquired at least some of the main non-technical factors necessary for the largest engineering success; and I doubt not that the greatest of these factors was his ability to use clear, forceful English in common conversation and in a formal written report. Finally, however, let me remind you that this ability cannot be acquired except by the development of one's intellectual powers to a high degree. In other words, the language one uses is a sure index of the quality of his education.

In conclusion, then, I beg each of you to take an inventory of the methods you have been using, and of the ideals you have been pursuing; and if necessary, I beg that you readjust them to conform to the newer ideals of the Engineering Profession. May you have high ambitions for your future success, and then work hard to realize them.

## ITEMS OF INTEREST

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The Committee on Publications will be glad to receive communications of general interest to the Society, and will consider them for publication in *Proceedings* in "Items of Interest". This is intended to cover letters or suggestions from our membership concerning matters which are not of a technical character. Such communications, however, must not be controversial or commercial.

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### THE ENGINEERING FOUNDATION

The Engineering Foundation was established in 1914 "for the furtherance of research in science and engineering, or for the advancement in any other manner of the Profession of Engineering and the good of mankind", and for the following purposes: To promote and support worthy researches related to engineering in all its branches; to establish and operate engineering research laboratories, if funds be provided therefor; to co-operate with National Research Council and the Engineering Societies in the stimulation and co-ordination of scientific research.

#### ENDOWMENT FUNDS NEEDED.

The Foundation needs a large increase of endowment. It is obliged frequently to refuse to support research projects brought to it because it lacks funds. Gifts of \$1 000 or more are desired. Each donor of \$250 000 or more will be honored as a Founder. A gift of \$50 000 has been offered contingent on the receipt of nine other gifts of \$50 000 each. Gifts to the Foundation are exempt from income tax. A gift for research is a productive investment.

The Foundation is compiling a directory of the hydraulic laboratories of the United States, and is planning an investigation of industrial education and training. It undertakes useful researches which do not promise profits sufficient to tempt industrial organizations to undertake them, researches which should be made under disinterested auspices, and researches which lie outside the province of Government bureaus.

The Engineering Foundation is administered under the auspices of the United Engineering Society, the American Society of Civil Engineers, the American Institute of Mining and Metallurgical Engineers, the American Society of Mechanical Engineers, and the American Institute of Electrical Engineers, by a board of thirteen representatives of these Societies, and three members at large.

A progress report of the Foundation, a form of Deed of Gift, and other information will be sent by the Secretary, Alfred D. Flinn, M. Am. Soc. C. E., 29 West 39th Street, New York City, on request.

#### Total Society Membership Now Exceeds 10 000

Due to the election of new members at the meeting of the Board of Direction held on April 25th, 1921, preceding the Annual Convention in Houston, Tex., the Society reached a total membership of 10 000 on May 3d, 1921. The present



membership is 10 010. On December 2d, 1920, the figure was 9 870, and the total membership as reported each month for the year 1921 is as follows:

January 6th.....	9 912
February 3d.....	9 874
March 3d.....	9 889
April 7th.....	9 971
May 5th.....	10 010

### RECENT LAWS FOR THE REGISTRATION OF ENGINEERS

In addition to the eleven States with laws regulating the practice of engineering in some form, abstracts of which have already been published,\* seven other States—Arizona, Indiana, Minnesota, North Carolina, New Jersey, Tennessee and West Virginia—now have license laws, and the Colorado and New York legislatures have approved new laws to amend the existing license laws of those States. The new Colorado bill was signed by the Governor on April 4th, 1921, and the New York bill was signed by Governor Miller on May 6th, 1921. A law for Pennsylvania has passed the legislature and has been sent to Governor Sproul for signature.

These new bills are based on Engineering Council's proposed uniform law,† and for the information of the membership the Indiana law is here reproduced in full, and the more important provisions in which this law and the similar laws in Arizona, Minnesota, North Carolina, New Jersey, and West Virginia are modifications of the proposed uniform law are indicated.

The important development in the situation in New York is the issue between corporations and practicing engineers. It has resulted in a protest by many prominent engineers against the amended form of the law as passed by the last legislature and submitted to the Governor. This protest, which was addressed to Governor Miller, is also reproduced, as it explains the issue and clearly expresses the arguments for and against the provision permitting corporations to practice engineering. The Governor signed the amended bill, however, and it is now the law of the State.

#### Indiana Licensing Law

*Title.*—An Act to regulate the practice of professional engineering and land surveying, to provide for the registration of professional engineers and land surveyors, and fixing a penalty.

*Be it enacted by the General Assembly of the State of Indiana, that:*

*Section 1. Engineers and Surveyors to be Licensed.*—In order to safeguard life, health and property, any person practicing or offering to practice professional engineering or land surveying in this State shall hereafter be required to submit evidence that he or she is qualified so to practice and shall be registered as herein-after provided and from and after six months after this Act goes into effect, it shall be unlawful for any person to practice or offer to practice professional engineering or land surveying in this State, unless such person has been duly registered under the provisions of this Act.

\* *Proceedings*, Am. Soc. C. E., October, 1920, p. 767.

† *Proceedings*, Am. Soc. C. E., January, 1920, p. 32.

*Section 2.* Nothing in this Act shall be construed as requiring registration for the purpose of practicing professional engineering, or land surveying by an individual, firm or corporation on property owned or leased by said individual, firm or corporation unless the same involves the public safety or public health.

*Section 3. Appointment of the Board.*—To carry out the provisions of this Act, there is hereby created a State Board of Registration for professional engineers and land surveyors, herein called the "Board", consisting of five members who shall be appointed by the Governor within sixty days after this Act goes into effect. At least two members shall be professional engineers, and at least two members shall be land surveyors. The members of the first Board shall be appointed to serve for the following terms: Two members for one year; two members for two years; and one member for three years; said term ending on the first day of January of the succeeding years. On the expiration of each of the said terms the term of office of each newly appointed or reappointed member of the Board shall be for a period of three years and shall terminate on the first day of January. Each member shall hold over after the expiration of his term until the successor shall be duly appointed and qualified. The Governor may remove any member of the Board for misconduct, incompetence, or neglect of duty. Vacancies in the membership of the Board, however created, shall be filled by appointment by the Governor for the unexpired term.

*Section 4. Qualifications and Expenses.*—Each member of the Board shall be a citizen of the United States and a resident of this State at the time of his appointment. He shall have been engaged in the practice of his profession for at least ten years and shall have been in responsible charge of work for at least five years. He shall be a member in good standing of a recognized society of professional engineers or surveyors and except as provided in Section 5 shall be a registered professional engineer or a registered land surveyor. Each member of the Board shall receive ten dollars (\$10) per day for attending sessions of the Board or of its committees, and for the time spent in necessary travel, and in addition, shall be reimbursed for all necessary traveling, incidental and clerical expenses incurred in carrying out the provisions of this Act.

*Section 5. Powers of the Board.*—Each member of the Board shall receive a certificate of appointment from the Governor, and before beginning his term of office he shall file with the Secretary of State an oath of office. Each member of the Board first created shall receive a certificate of registration under this Act from the Governor of this State. The Board or any committee thereof shall be entitled to the services of the Attorney General in connection with the affairs of the Board, and the Board shall have power to compel the attendance of witnesses, may administer oaths and may take testimony and proofs concerning all matters within its jurisdiction. The Board shall employ a competent secretary to be selected by the Board, but who shall not be a member of the Board. The Board shall adopt and have an official seal which shall be affixed to all certificates of registration granted; and shall make all by-laws and rules, not inconsistent with law, needed in performing its duty. Suitable office quarters shall be provided by the State for the use of the Board in the City of Indianapolis.

*Section 6. Organization and Meetings of the Board.*—The Board shall hold a meeting within thirty days after its members are first appointed, and thereafter

shall hold at least two regular meetings each year. Special meetings shall be held at such times as the by-laws of the Board may provide. Notice of all meetings shall be given in such manner as the by-laws may provide. The Board shall elect annually from its members a chairman and a vice-chairman. Three members of the Board shall constitute a quorum for the transaction of all business except as otherwise provided in Section 11.

*Section 7. Receipts and Disbursements.*—The Secretary of the Board shall receive and account for all moneys derived from the operation of this Act and shall pay them into the State treasury. Such funds shall be kept in a separate fund to be known as the "Fund of the Board of Registration for Professional Engineers and Land Surveyors", which fund shall be continued from year to year and shall be drawn against only for the purpose of this Act as herein provided, except that at the end of each fiscal year of the State of Indiana any excess above five thousand dollars (\$5 000) in said fund shall revert to the common school fund of the State of Indiana. All expenses certified by the Board as properly and necessarily incurred in the discharge of its duties, including authorized compensations, shall be paid out of said fund on the warrant of the Auditor of the State issued on requisitions signed by the chairman and the secretary of the Board; provided, however, that at no time after this Act has been in effect shall the total of warrants issued exceed the total amount in said fund. The secretary of the Board shall give a surety bond by some surety company authorized to transact business in Indiana and conditioned upon the faithful performance of his duties. The premium on said bond shall be a proper and necessary expense of the Board.

*Section 8. Records and Reports.*—The Board shall keep a record of its proceedings and a register of all applicants for registration showing for each the date of application, name, age, education and other qualifications, place of business and place of residence, whether or not an examination was required and whether the applicant was rejected, or a certificate of registration granted, and the date of such action. A roster showing the names and places of business and of residences of all registered professional engineers and land surveyors, shall be prepared by the secretary of the Board before the first day of December of each year; such roster shall be printed by the State as other State reports are printed and shall be paid for out of the funds of the Board as provided in Section 7.

On the last day of each fiscal year of the State of Indiana, the Board shall submit to the Governor a report of its transactions for the preceding year, and shall file with the Secretary of State a copy of such report, together with a complete statement of the receipts and expenditures of the Board, attested by the affidavits of the chairman and the secretary, and a copy of the said roster of registered professional engineers and registered land surveyors.

*Section 9. Applications for and Issuance of Certificates.*—The Board shall, on application therefor, on prescribed form and the payment of a fee of twenty-five dollars (\$25) issue a certificate of registration:

1.—To any person who submits evidence satisfactory to the Board that he or she is fully qualified to practice professional engineering or land surveying; or

2.—To any person who holds a like unexpired certificate of registration issued to him or her by proper authority in any State or territory of the United States, or in any province of Canada, in which the requirements for the registration of

professional engineers or land surveyors are of a standard satisfactory to the Board;

Provided, however, that no person shall be eligible for registration who is under twenty-five years of age, who is not a citizen of the United States or Canada, or who has not made declaration of his or her intention to become a citizen of the United States, who does not speak or write the English language, who is not of good moral character and repute, and who has not been actively engaged for six or more years in the practice of professional engineering, or land surveying, of character satisfactory to the Board; provided, however, that each year of teaching, or of study satisfactorily completed, of engineering in a school of engineering shall be considered as equivalent to one year of such active practice.

Unless disqualifying evidence be before the Board, the following facts established in the application shall be regarded as *prima facie* evidence satisfactory to the Board that the applicant is fully qualified to practice professional engineering or land surveying;

(a) Ten or more years of active engagement in professional engineering or land surveying work;

(b) Graduation, after a course of not less than four years in engineering, from a school or college approved by the Board as of satisfactory standing, and an additional four years of active engagement in professional engineering, or land surveying work.

Applicants for registration, in cases where the evidence originally presented in the application does not appear to the Board conclusive or warranting the issuance of a certificate, may present further evidence which may include the results of a required examination, for the consideration of the Board.

In case the Board denies the issuance of a certificate to an applicant, 60% of the registration fee deposited shall be returned by the Board to the applicant.

Certificates of registration shall expire on the last day of the month immediately following the expiration of the fiscal year in which they were issued or renewed, and shall be invalid after that date unless renewed. It shall be the duty of the secretary of the Board to notify by mail every person registered hereunder of the date of expiration of his certificate and the amount of the required fee for its renewal for one year; such notice should be mailed at least one month in advance of the date of the expiration of said certificate. Renewal may be effected at any time by the payment of a fee of ten dollars (\$10) to the secretary of the Board, which payment shall be accredited to the funds of the fiscal year for which paid. The failure on the part of any registrant to renew his certificate annually as required above shall not deprive such person of the right of renewal thereafter, but the fee to be paid for the renewal of a certificate that has become invalid by failure to renew, shall be increased 10% for each month or a fraction of a month that payment for renewal is delayed; provided, however, that the maximum fee for delayed renewal shall not exceed twenty dollars (\$20).

*Section 10.* At any time within one year after this Act goes into effect upon due application therefor and the payment of a fee of twenty-five dollars (\$25), the Board shall issue a certificate of registration, as provided by Section 9, to any professional engineer or land surveyor who shall submit evidence under oath satisfactory to the Board that he is of good character, has been a resident



of the State of Indiana for at least one year immediately preceding the date of his application, and was practicing professional engineering or land surveying at the time that this Act became effective. After this Act shall have been in effect one year, the Board shall issue certificates of registration only as provided in Section 9 thereof.

*Section 11. Revocation and Reissue of Certificates.*—The Board shall have the power to revoke the certificate of registration of any professional engineer or land surveyor registered hereunder who is found guilty of any fraud or deceit in obtaining a certificate of registration or of gross negligence, incompetence, or misconduct in the practice of professional engineering or land surveying. Any person may prefer charges of such fraud, deceit, negligence, incompetence or misconduct against any professional engineer or land surveyor registered hereunder; such charges shall be in writing and sworn to by the complainant and submitted to the Board. Such charges, unless dismissed without hearing by the Board as unfounded or trivial, shall be heard and determined by the Board within three months after the date on which they are preferred. A time and place for such hearing shall be fixed by the Board. A copy of the charges, together with a notice of the time and place of hearing, shall be legally served on the accused at least thirty days before the date fixed for the hearing and in the event that such service cannot be effected thirty days before such hearing, then the date of hearing and determination shall be postponed as may be necessary to permit the carrying out of this condition. At said hearing the accused shall have the right to appear personally and by counsel and to cross-examine witnesses against him or her and to produce evidence and witnesses in his or her defense. If after said hearing four or more members of the Board vote in favor of finding the accused guilty of any fraud or deceit in obtaining a certificate or of gross negligence, incompetence or misconduct in the practice of professional engineering or land surveying, the Board shall revoke the certificate of registration of the accused.

The decision of the Board shall be subject to review in the Marion Circuit Court of Marion County, such appeal to be taken within six months after the day on which the order was made by the Board.

The Board may reissue a certificate of registration to any person whose certificate has been revoked, provided four or more members of the Board vote in favor of such reissue.

The Board shall immediately notify the Secretary of State of its findings as to the issuance, revocation or reissuance of certificates of registration.

A new certificate of registration to replace any certificate lost, destroyed or mutilated may be issued, subject to the rules and regulations of the Board. A charge of one dollar (\$1) shall be made for such reissue.

*Section 12. Significance of Certificate; Seals.*—The issuance of a certificate of registration by this Board shall be evidence that the person named therein is entitled to all the rights and privileges of a registered professional engineer, or registered land surveyor while the said certificate remains unrevoked or unexpired.

Each registrant hereunder shall upon registration obtain a seal of the design authorized by the Board, bearing the registrant's name and the legend "Professional Engineer" or "Land Surveyor". Plans, specifications, plats, and reports issued by a registrant may be stamped with said seal during the life of registrant's

certificate, but it shall be unlawful for any one to stamp or seal any document with said seal after the certificate of the registrant named thereon has expired or has been revoked unless said certificate has been renewed or reissued.

*Section 13. Unlawful Acts and Penalties.*—Any person who after this Act has been in effect six months is not legally authorized to practice professional engineering or land surveying in this State according to the provisions of this Act and shall so practice or offer to practice in this State, except as provided in Section 14 of this Act, and any person presenting or attempting to file as his own the certificate of registration of another, or who shall give false or forged evidence of any kind to the Board, or to any member thereof, in obtaining a certificate of registration or who shall falsely impersonate any other practitioner of like or different name, or who shall use or attempt to use an expired or revoked certificate of registration, shall be guilty of a misdemeanor, and shall for each such offense of which he is convicted be punished by a fine of not less than one hundred dollars (\$100) nor more than five hundred dollars (\$500), or by imprisonment for three months, or by both fine and imprisonment.

*Section 14. Exemptions.*—The following shall be exempted from the provisions of this Act:

1.—Offering to practice in this State as a professional engineer or land surveyor, by any person not a resident of and having no established place of business in this State.

2.—Practice as a professional engineer, or land surveyor, in this State by any person not a resident of and having no established place of business in this State, or any person resident in this State, but whose arrival in this State is recent; provided, however, such a person shall have filed an application for registration as a professional engineer or a land surveyor and shall have paid the fee provided for in Section 9 of this Act. Such exemption shall continue for only such reasonable time as the Board requires in which to consider and grant or deny the said application for registration.

3.—Engaging in professional engineering or land surveying as an employee of a registered professional engineer, or a registered land surveyor, or as an employee of a professional engineer, or a land surveyor, authorized by paragraph 2 of this Section.

4.—Practice of professional engineering and land surveying solely as an officer of the United States.

5.—Practice of professional engineering, or land surveying, solely as an employee or officer of this State or any political sub-division thereof at the time this Act becomes effective and thereafter only until the expiration of the then existing term of office of such employee.

6.—Practice of land surveying by a duly elected and qualified county surveyor of any county in the State of Indiana.

*Section 15. Corporations or Partnerships.*—A corporation or partnership may engage in the practice of professional engineering or land surveying in this State, provided the person or persons connected with such corporation or partnership in charge of the designing or supervision which constitutes such practice is or are registered as herein required of professional engineers and land surveyors. The same exemptions shall apply to corporations as apply to individuals under this Act.

*Section 16. Land Surveying.*—Land surveying as covered by this Act refers only to surveys for the determination of areas or for the establishment of land boundaries and the subdivision and platting of land. Nothing in this Act shall be construed as prohibiting registered professional engineers from making land surveys.

*Section 17.* All laws or parts of laws in conflict with the provisions of this Act are hereby repealed.

#### COMPARISON WITH ENGINEERING COUNCIL'S UNIFORM LAW.

The Indiana law differs from Engineering Council's recommended uniform law essentially as follows:

The Act regulates the practice of professional engineering and land surveying only—architecture is not included. The words “and fixing a penalty” are added to the title.

*Section 1.*—The time after which unlicensed practice is illegal is inserted as six months after the Act becomes effective.

*Section 3. Appointment of the Board.*—The Board of Registration consists of five, instead of seven, members—at least two professional engineers and two land surveyors, instead of three of the former and three architects. The requirement that not more than one member shall be from the same branch of the profession is omitted. The terms of the first appointments are modified, and three years instead of four is the regular period for holding office, beginning January 1st.

*Section 4. Qualifications and Expenses.*—Provides \$10 per day as the recompense for members of the Board, in addition to traveling expenses.

*Section 5. Powers of the Board.*—A provision that the Board shall employ a competent secretary, not a member of the Board, is inserted.

*Section 6. Organization and Meetings of the Board.*—The Secretary is not elected from the members of the Board, and three members constitute a quorum instead of four, a proviso being added by reference to Section 11.

*Section 7. Receipts and Disbursements.*—The following provision in regard to drawing funds only for purposes of the Act is added:

“except that at the end of each fiscal year of the State of Indiana any excess above \$5 000 in said fund shall revert to the common school fund of the State of Indiana”.

Other minor changes in wording are made.

*Section 8. Records and Reports.*—The first day of December is specified as the date before which a roster of registered engineers and surveyors must be prepared each year by the Secretary of the Board, to be printed as other State reports are printed. The provision that copies must be sent to and filed by clerks of every incorporated city, town, or county in the State is omitted. The report must be submitted to the Governor on the last day of each fiscal year of the State of Indiana.

*Section 9. Applications for and Issuance of Licenses.*—A fee of \$25 is specified. Provision (c) that full membership in certain National Societies establishes *prima facie* evidence of qualifications is omitted. All references to architects are omitted. Instead of returning the whole fee in case of denying the issuance of a certificate, only 60% is returned to the applicant. Certificates expire on the

last day of the month immediately following the expiration of the fiscal year, and renewal is effected by a payment of \$10.

A new Section 10 is added, providing for registration of those in active practice at the time the law takes effect.

*Section 11. Revocation and Reissue of Licenses.*—Changed only in requiring a vote of four members of the Board, instead of five, to revoke or reissue certificates, making the decision subject to review by the Marion Circuit Court of Marion County, and in omitting the requirement that clerks of incorporated towns, etc., be notified.

*Section 12. Significance of Certificate; Seals.*—Changed only in specifying "professional engineer" instead of "registered professional engineer"; similarly for land surveyor.

*Section 13. Unlawful Acts and Penalties.*—Specifies a six months' time limit after going into effect, and omits reference to registered architects and the practice of architecture.

*Section 14. Exemption.*—Omits fifteen-day limiting paragraph, and adds the following to the exemption paragraphs:

"6.—Practice of land surveying by a duly elected and qualified county surveyor of any county in the State of Indiana."

Section 15 of the uniform law in regard to public work is omitted.

*Section 16. Land Surveying.*—The phrase "where such surveys are essential to engineering or architectural projects" is omitted.

### Arizona Law Includes Assaying

The Arizona law regulates not only the practice of architecture, engineering, and land surveying, but also includes assaying. It was signed by the Governor on March 19th, and goes into effect on June 9th, 1921; licenses must be obtained six months thereafter. It is based on Engineering Council's uniform law, the principal modifications thereof being as follows:

To the title is added

"providing for the creation of a Board of Examiners and granting to said Board certain powers and prescribing its duties, and providing for the registration of and the issuance of certificates of registration to professional architects, assayers, engineers and land surveyors; repealing all Acts or parts of Acts in conflict herewith, and providing penalties for the violation of this Act."

In Sections 1 and 11, six months is prescribed as the time limit after which unlicensed practice is illegal.

*Section 2.*—The following is added to the exemptions as stated in the uniform bill:

"nor as requiring registration by any person who, prior to the time of the passage of this Act, was engaged in the practice of architecture, engineering, land surveying or assaying; provided, however, such person shall not represent himself as, or use the title of, 'Registered Architect', 'Registered Professional Engineer', 'Registered Land Surveyor' or 'Registered Assayer', unless such person is qualified by registration under this Act."

*Section 3. Appointment of the Board.*—Members of the Board must be residents of the State for three years immediately preceding appointment. The Governor



appoints six members, instead of seven, and the Dean or Acting Dean of the College of Mines and Engineering of the University of Arizona is *ex-officio* a member of the Board. Diversity of membership in the Board is provided for as follows:

"Each of the remaining six members of the Board shall be a professional architect, engineer or assayer, as defined in this Act, and it shall be incumbent upon the Governor to see that the Board is at all times made up of representatives of the greatest possible diversity of professions or vocations covered by this Act."

The terms of office are three years, instead of four, and the qualifications for membership are five years practice instead of ten (as required by Section 4 of the uniform bill), and an age limit of 35 years minimum is specified. The requirement for membership in recognized societies is omitted.

No specific allowance for compensation to members of the Board other than traveling expenses is made.

*Section 7. Records and Reports.*—The time for the preparation of a roster is not specified, and November 1st is given as the date for the report of the Board to the Governor.

*Section 8.—Applications for and Issuance of Certificates.*—A fee of \$15.00 is specified for architects or engineers, and \$10.00 for land surveyors or assayers. The following additional qualification paragraph is added:

"To any person who submits to the Board evidence that at the time of the passage of this Act he had been practicing as an architect, engineer, land surveyor or assayer for a period of three years prior to the date of the taking effect of this Act, and during said time had been a *bona fide* resident of the State of Arizona, and was still at the date of such application a resident of the State of Arizona."

The six year requirement for practice is reduced to three years, and the *prima facie* evidence is likewise reduced from ten years to three years in paragraph (a). In paragraph (c) the American Association of Engineers is added as a society membership in which is *prima facie* evidence. The limiting date of renewal is set as December 31st, and a \$5 renewal fee is required.

*Section 12. Exemptions.*—The time limit of fifteen days in a calendar year for allowable practice of non-residents is raised to thirty days. Under Exemption 4, the following is added:

"or engaging, by a non-resident, in architectural, engineering, land surveying or assaying work as a fulltime employee of an individual, firm or corporation having an established business in this State, of any character, when such practice shall be temporary in character and in no event to exceed a period of ninety (90) days."

The following exemption paragraphs are added:

"Practice of architecture, engineering, land surveying or assaying by any person not a resident of and having no established place of business in this State, as a consulting associate of an architect, an engineer, a land surveyor or an assayer registered under the provisions of this Act; provided, the non-resident is qualified for such professional service in his own State or country.

"Designing or executing work of an architectural or engineering character by a person not an architect or an engineer; provided that such person does not represent himself as an architect or as an engineer; and provided further that on drawings, specifications or other documents prepared or issued by such person the title Architect or Engineer shall not be used, nor any other title which might imply that such person is an architect or an engineer."

*Section 13. Corporations or Partnerships.*—The word "responsible" is added, thus requiring only those in "responsible charge" to be licensed.

*Section 14. Public Work.*—The limit for Government projects is raised from \$2 000 to \$5 000.

The following sections are new:

*"Section 16.*—Any unrevoked or unexpired certificate of registration issued as provided in this Act shall be *prima facie* evidence in all courts and places that the person named therein is legally registered to practice in the State of Arizona.

*"Section 17.*—All words used herein importing the masculine gender may also imply as importing the feminine gender.

*"Section 18.*—Any part of this Act that may be found to be unconstitutional shall not invalidate any other portion of the Act nor the whole thereof."

### Minnesota Law Permits Unlicensed Practice

The Minnesota law was approved on April 25th, 1921, and licenses must be obtained within six months after that date. It regulates the practice of architecture, engineering and land surveying, and, somewhat as in the Arizona law, practice by those who do not represent themselves to be registered is permitted; in addition, persons selected by public authorities to perform public work do not have to be registered. These provisions in detail are given in Section 2 as follows:

*"Section 2.*—Nothing in this Act shall be construed as requiring registration for the continuation of his practice by any person who prior to the passage of this Act resided in this State and practiced as an architect, as an engineer or as a land surveyor; provided, however, no person shall represent himself as, or use the title of, 'Registered Architect', 'Registered Professional Engineer', or 'Registered Land Surveyor', unless such person is qualified by registration under this Act; nor shall anything in this Act be construed as requiring registration by any person not an architect or an engineer who may engage in work of an architectural or engineering character; provided, that such person shall not represent himself as a registered architect or as a registered engineer; and provided further, that on drawings, specifications or other documents prepared or issued by such person, he shall not use the title 'Registered Architect' or 'Registered Engineer', or any other title implying that he is a registered architect or a registered engineer; nor shall anything in this Act be construed as requiring registration by any person selected by any municipality or other public authority to perform public work in the State of Minnesota."

*Section 3. Appointment of the Board.*—One of the seven members of the Board is required to be a registered land surveyor, and January 1st is specified for the beginning of terms of office.

Allowance for compensation of members of the Board at the rate of \$10.00 per day, with traveling expenses, is made in Section 7, instead of Section 4.

*Section 5. Powers of the Board.*—The following is specified as part of the powers of the Board:

"and shall fix standards for determining the qualifications of applicants for certificates, which shall not exceed the requirements contained in the curriculum of a recognized school of architecture or engineering."

*Section 6. Organization and Meetings of the Board.*—Secretary is changed to secretary-treasurer.

*Section 8. Records and Reports.*—The roster is to be prepared in January, and the report to the Governor before February 1st.

*Section 9. Application for and Issuance of Certificates.*—A fee of \$25.00 is specified for architects and engineers, and \$10.00 for land surveyors. Four years' experience instead of six is prescribed for land surveyors. The phrase "the character of such work shall be equal to the standards fixed by the Board" is added, and the paragraphs on *prima facie* evidence are omitted. The following provisions are added:

"and in determining the qualifications of applicants for registration as land surveyors the affirmative vote of the land surveyor member and of one engineer of the Board, only, shall be required.

"Any person so qualified may be registered in two or all of the three professions covered by this Act; but the aggregate fee for such registration shall not exceed twenty-five (\$25.00) Dollars."

The renewal fee is \$5.00 for architects and engineers, and \$2.00 for land surveyors, and renewal must be obtained during the month of December each year; late renewal fees are \$7.00 and \$3.00 respectively. The following is added:

"The aggregate fee for renewal of registration in two or three of the professions shall be the same as the single renewal fee for registration as an architect or an engineer."

*Section 10. Revocation and Reissue of Certificates.*—The requirement that the Secretary of State and the clerks of cities, etc., must be notified is omitted.

*Section 12. Unlawful Acts and Penalties.*—The lower limit of the fine is made \$50.00, instead of \$100.00.

*Section 13. Exemptions.*—The time limit of fifteen days in a calendar year for allowable practice of non-residents is raised to thirty days, and practice by non-residents as "consulting associates" of registered practitioners is permitted.

The section of the uniform law relating to public work is omitted, and Section 15, defining land surveying, omits the sentence permitting engineers and architects to make surveys.

#### **North Carolina Law for Engineers and Surveyors**

The North Carolina law was approved on February 25th, 1921, and licenses must be obtained within twelve months after that date. It regulates the practice of engineering and land surveying only, and differs from Engineering Council's proposed uniform law principally as follows:

*Section 3. Appointment of the Board.*—The Board consists of five, instead of seven members; one must be a member of the engineering faculty of the North Carolina State College of Agriculture and Engineering, and one a member of the engineering faculty of the University of North Carolina. Not more than three members (instead of one) shall be from the same branch of engineering, and December 31st is specified as the end of the terms of office.

*Section 4. Qualifications and Expenses.*—The requirements for five years in responsible charge of work, for membership in a professional society, and for registered members are omitted. Compensation is prescribed at \$10.00 per day.

*Section 5. Powers of the Board.*—Services of the Attorney General are not provided for, nor are any office quarters specified.

*Section 6. Organization and Meetings of the Board.*—A quorum is specified as three members, instead of two architects and two engineers.

*Section 7. Receipts and Disbursements.*—The provision that warrants must not exceed expenditures is not limited to one year.

*Section 8. Records and Reports.*—The roster is to be prepared in January, and the report to the Governor made on March 1st of each year.

*Section 9. Applications for and Issuance of Certificates.*—A fee of \$25.00 is specified for engineers and \$10.00 for surveyors. The following is added to the provisions regarding satisfactory evidence: "such evidence after January 1st, 1923, to include an examination, oral or written".

The following reciprocity provision is added:

"Provided, however, that the Engineering Registration Board of said States or territories shall grant full and equal reciprocal registration rights and privileges to North Carolina registrants."

The twenty-five year age limit is reduced to twenty-one years, and the requirement for a minimum of six years' practice is omitted. In the specified *prima facie* evidence, the number of years of practice is reduced from ten to five for engineers and three for surveyors, and the following is added:

"Provided, however, each year of teaching, or of study satisfactorily completed, in a college of standing satisfactory to the Board shall be considered as equivalent to one of such active practice: Provided, further, the period spent in the Army, Navy, Marine Corps, or other Government service of the United States in the late war by any student whose engineering education was interrupted by such service shall also be counted as equivalent to an equal period of active practice: Provided, however, application for registration is made within twelve months after the ratification of this Act."

Graduates in engineering are not required to have four years practice, as in paragraph (b) of the uniform law. Certificates expire on December 31st, must be renewed in January of each year, and the renewal fee is \$5.00.

*Section 10. Revocation and Reissue of Certificates.*—A provision that the hearing of charges shall be held in the county in which said charges originated is added, and a unanimous vote (instead of five members) is required to revoke. Three or more, instead of five or more, are required to vote in favor of the reissue of a certificate, and no charge for replacing a lost certificate is specified.

*Section 12. Unlawful Acts and Penalties.*—The upper limit of \$500 for the fine is omitted, as is also the provision regarding architects.

*Section 13. Exemptions.*—The time limit for allowable practice of non-residents is raised from fifteen days to thirty days in a calendar year, the words "or assistant" are added, and employees or assistants of non-resident engineers are also exempted. The following new paragraph is added:

"Practice of engineering or land surveying by any person not a resident of and having no established place of business in this State, as a consulting associate of an architect, engineer or a land surveyor registered under the provisions of this Act: Provided, the non-resident is qualified for such professional service in his own State or country."

Exemption No. 6 relating to employees of the State is omitted.

Section 15 relating to public work is omitted, and a new Section 17 declares the law to be effective on ratification—February 25th, 1921.



### New Jersey Law for Engineers and Surveyors

The New Jersey law was approved on April 8th, 1921, and licenses must be obtained within two years after that date. It regulates the practice of engineering and land surveying, and differs from the proposed uniform law of Engineering Council principally as follows, the sections being renumbered:

*Section 2. Appointment of the Board.*—Five instead of seven is prescribed for the number of members of the Board, which is designated as the "State Board of Professional Engineers and Land Surveyors". The provision for three engineer and three architect members is omitted, the terms of the first members, which begin May 1st, 1921, are revised, and the regular term is increased from four to five years.

*Section 3. Qualifications and Expenses.*—No compensation, except traveling and clerical expenses, is prescribed.

*Section 5. Organization and Meetings of the Board.*—The Board is to elect a President, Vice-President, Secretary, and Treasurer, who hold office for one year. The Treasurer must give a bond; the Secretary need not be a member of the Board, and may receive a salary not to exceed \$500 per year. A quorum shall consist of three members.

*Section 6. Receipts and Disbursements.*—The Treasurer is to receive and account for all funds, instead of the State Treasurer in a separate fund as provided in the uniform law. He must submit an itemized account to the Secretary of State within twenty days after the close of the Board's fiscal year. The following new provision is added:

"The Secretary of State shall be paid such fees for filing the report as are now paid for filing similar papers in his office. All surplus in the hands of the Board at the end of the fiscal year shall be paid to the State Treasurer."

*Section 7. Records and Reports.*—The roster is to be prepared in June of each year, and the requirements for a report to the Governor and for filing of the roster with the Secretary of State are omitted.

*Section 8. Applications for and Issuance of Certificates.*—A fee of \$25.00 is specified, and \$35.00 for the practice of both engineering and surveying. The District of Columbia is added and Canada is omitted from the list of States or countries licensed residents of which shall receive licenses. The minimum age limit is reduced from twenty-five to twenty-one years, and the requirement for active practice reduced from six years to four years for engineers and three years for surveyors, one year of responsible charge being required for engineers. The requirements of citizenship and mastery of the English language are omitted in the case of engineers, but prescribed for surveyors. Study in engineering schools is credited only for one half of the time spent—two years being considered equivalent to one year of active practice.

In the case of evidence considered as *prima facie* evidence "satisfactory to the Board", six years for engineers, one in responsible charge of work, and four years for surveyors are specified instead of ten years of active practice, but the land surveying work must be "of a character satisfactory to the Board". Graduates must have had one year in responsible charge to be licensed as engineers, and two years' practice in professional land surveying satisfactory to the Board to be

licensed as surveyors. The paragraph qualifying the members of National societies is omitted. The following new paragraphs are added:

"In determining the qualifications of applicants for license as Professional Engineers or Land Surveyors, character shall be given predominant weight and a majority vote of the members of the Board shall be required to pass upon the issuance of a license to any applicant.

"*Section 9.*—The said Board after examination or receiving other evidence of qualifications as provided by this Act, shall issue a license to the applicant therefor, certifying said applicant to have passed such examination or as being otherwise qualified to practice professional engineering and land surveying.

"Any person receiving such license shall cause the same to be recorded in the office of the Secretary of State, in a book to be kept for that purpose, and shall pay such recording fee as may be provided by law for the recording of similar documents."

Section 10 prescribes for renewal of licenses during the month of April for a fee of \$1.00.

*Section 11. Revocation and Reissue of Certificates.*—Three (instead of five) members of the Board must vote in favor in order to revoke a license, but no specific vote is prescribed to reissue, which is permitted as follows:

"The Board may, under circumstances which to it seem proper, reissue a certificate of license to any person whose certificate has been revoked."

Notification of the Secretary of State is omitted, and a charge of \$10.00 instead of \$1.00 is made for the issuance of a new certificate to replace one lost, destroyed or mutilated.

*Section 12. Significance of Certificates; Seals.*—The word "Licensed" is used instead of "Registered" for the prescribed seals.

*Section 13. Unlawful Acts and Penalties.*—The reciprocal provision regarding practice of engineering and architecture is omitted.

*Section 14. Exemptions.*—Thirty days during a calendar year is prescribed as the limit for practice of non-residents without license. Residence in the State for less than three months is added to the provision requiring non-residents to apply for a license. "An employee or pupil of, or under the direction of" a licensed engineer or surveyor is exempt.

The section of the uniform law (Section 14) relating to practice by corporations is omitted.

*Section 15. Public Works.*—Two years after the Act goes into effect (instead of one) is prescribed, and the words "neither the State nor" are omitted in defining political divisions which must not engage in public work except by licensed engineers or surveyors.

*Section 16. Land Surveying.*—After defining land surveying, this section is revised as follows:

"Nothing in this Act shall be construed as prohibiting licensed professional engineers from making land surveys where such surveys are essential to engineering projects, nor as prohibiting any person from doing land surveying; provided he does not hold himself out to be a licensed land surveyor, and accept or receive compensation for such service."

The following definition of Professional Engineering is added:

"*Section 17. Professional Engineering.*—Professional Engineering as covered by this Act means the practice of the professional engineer who through technical

knowledge gained by education and experience in one or more branches of that Profession initiates, investigates, plans and directs the application of the resources of nature to the use and convenience of man; and who represents himself or herself to be such an engineer, either through the use of the term engineer with or without qualifying adjectives, or through the use of some other title implying that he or she is such an engineer."

### West Virginia Law Regulates Practice of Engineering

The West Virginia law was approved on May 4th, becomes effective on July 26th, 1921, and licenses must be obtained within six months after the latter date. It regulates the practice of engineering only, and differs from Engineering Council's proposed uniform law principally as follows:

Men only are authorized to practice.

Section 2 is revised to read as follows:

"*Section 2.*—Nothing in this Act shall be construed as requiring registration by an individual, firm or corporation for the purpose of practicing engineering on property owned or leased by said individual, firm or corporation, nor as requiring registration by any person who prior to the time of the passage of this Act was engaged in the practice of engineering; provided, however, such person shall not represent himself as, or use the title of 'Registered Professional Engineer' unless such person is qualified by registration under this Act."

*Section 3. Appointment of the Board.*—The Board consists of five, instead of seven members, to be appointed by the Governor within thirty days. All members must be registered engineers, the members of the first Board to be appointed as follows: two for one year, two for two years, one for three years, these terms to end on June 30th. The Governor may remove any member of the Board at his "will and pleasure". This section provides that the office of the Board shall be at the Capitol.

*Section 4. Qualifications and Expenses.*—Members of the Board are required to have had at least five, instead of ten, years of active practice, and to have been in responsible charge of work for at least three, instead of five, years. Compensation at the rate of \$10.00 per day is provided for in Section 7 instead of Section 4.

*Section 6. Organization and Meetings of the Board.*—A quorum is specified as three members, instead of two architects and two engineers.

*Section 8. Records and Reports.*—The roster is to be prepared in July, and the report to the Governor made on or before September 30th of each year.

*Section 9. Applications for and Issuance of Certificates.*—A fee of \$20.00 is specified. The age limit is reduced from twenty-five to twenty-one years of age, and the American Association of Engineers is substituted for the American Institute of Architects. A majority vote only of the Board is required. Certificates of registration expire on June 30th, and renewal may be effected during the month of June by payment of a fee of \$10.00.

*Section 10. Revocation and Reissue of Certificates.*—Three or more, instead of five or more, members of the Board are required to revoke or to reissue a certificate.

*Section 12. Unlawful Acts and Penalties.*—The provision for reciprocal practice of engineering and architecture is omitted.

*Section 13. Exemptions.*—The time limit for non-residents is raised from fifteen days to thirty days in a calendar year, and the following revisions and additions are made:

"(e).—Practice of engineering by any person not a resident of and having no established place of business in this State, as a consulting associate of an engineer registered under the provisions of this Act; provided, the non-resident is qualified for such professional service in his own State or country.

"(f).—Practice of engineering solely as an officer or as an employee of the United States or of a common carrier engaged in interstate business.

"(g).—Practice of engineering solely as an employee of this State or any political sub-division thereof, or of any corporation, firm or individual when such engineer's time is devoted exclusively to such employment, and such engineer does not offer his services to the public generally for hire.

"(h).—Any engineer who shall not represent himself as, or use the title of, 'Registered Professional Engineer', unless such person is qualified by registration under this Act."

Section 15 in regard to Public Work is omitted, as is also Section 16, which defines land surveying.

### The New York License Law Situation

A critical situation has developed in New York State in the attempt of members of the State Board of Licensing, consisting of W. J. Wilgus, Chairman, Albert H. Hooker, H. G. Reist, P. E. Barbour, and Virgil M. Palmer, to amend the licensing law regulating the practice of professional engineering and land surveying. A bill, known as Senate Bill 147, designed to effect amendments to the existing law, was introduced in order to eliminate Section 39*k*, which permits non-engineers under the guise of corporations and unrestricted partnerships to practice professional engineering, to add a definition of engineering, and to provide for the renewal of licenses.

Later, a bill known as Senate Bill 147 716 was introduced, in which the definition of professional engineering was rephrased in a manner objectionable to the members of the Board, and the right of corporations and unrestricted partnerships to practice engineering was reaffirmed in language even stronger than in the existing act. This bill passed the Legislature and was signed by Governor Miller on May 6th, 1921.

Under date of April 14th, 1921, a letter was forwarded to Governor Miller requesting his veto of the amended bill. This letter was signed by forty-nine prominent engineers of New York, including the names of the following members of the Society: W. J. Wilgus, L. B. Stillwell, F. A. Molitor, D. L. Turner, Robert Ridgway, C. M. Holland, J. Waldo Smith, Arthur S. Tuttle, Robert H. Jacobs, George H. Pegram, J. A. L. Waddell, Thomas E. Brown, William H. Burr, W. S. Kinnear, S. Whinery, John F. Wallace, J. Vipond Davies, P. W. Henry, William Barclay Parsons, Charles W. Leavitt, J. P. Hogan, T. Kennard Thomson, George Gibbs, C. M. Ingersoll, H. DeB. Parsons, E. R. Hill, Merritt H. Smith, J. P. Hallihan, Howard C. Baird, Frank J. Sprague, Allen Hazen, W. E. Fuller, Malcolm Pirnie, Rudolph Hering, James B. French, Clemens Herschel, Sverre Dahm, George W. Fuller, H. N. Latey, John N. Myers, James H. Fuertes, O. H. Landreth, George A. Johnson, and Rudolph P. Miller. The following extracts from the letter explain the issue:

### DISCRIMINATION NULLIFIES INTENT OF LAW.

"First.—The opponents of the bill allege that the intent of the law is nullified in permitting groups of non-engineers—bankers or what-not—under the



guise of corporations, unrestricted partnerships and joint stock associations, indirectly to do those very things which the individual non-engineer is prohibited from doing; and, it may be added, to do those things which the qualified engineer may only do after he has had his technical and moral qualifications subjected to a searching examination and after he has paid the prescribed fee.

"The proponents of the bill fail to reply to this charge of discrimination, which would seem to have sufficient weight to warrant a veto of the bill on this point alone.

#### DIVIDED ALLEGIANCE.

"*Second.*—The opponents consider that the bill sanctions a practice that easily may be made an immoral one, in permitting an aggregation of individuals, in whole or part non-engineers, to serve in the dual capacity of supposedly disinterested professional advisers to a client and at the same time as self-interested financiers, sellers or contractors in the execution and supervision of the work in connection with which such professional advice is given, such sanction being diametrically opposed to the universally recognized rule that the engineer shall not be personally interested, directly or indirectly, in a company with which he has relations on behalf of his employer or client.

"The proponents say that it is impossible to discover any serving in a dual capacity, in the simultaneous performance of 'the functions of design and of construction or in performing the function of design for one client and of construction for another \* \* \*'. They have missed the point. What is viewed by us with alarm is the sanctioning of a condition under which an engineering corporation may have bankers, manufacturers and contractors on its board who may so dominate its policy as to influence its management, including its engineering employees, in the preparation of reports, plans, contracts and specifications and in the supervision of work, in such manner as to favor the outside interests of such directors to the injury of the client (the public). This is no idle fear. In the case of common carriers this practice of interlocking directorates is forbidden by law.

#### LOSS OF PROFESSIONAL RESPONSIBILITY.

"*Third.*—The opponents feel that the professional engineer in the employ of an engineering corporation or unrestricted partnership, made up in whole or part of non-engineers, is relegated to a position of anonymity or that of the servant, relieving him of all professional responsibility to the client and placing him under the direction of those whose primary interest is a banker's or contractor's profit.

"The proponents mistake this point to mean that were it to have weight, even the independent engineer could not employ assistants, which, of course, is not the case. The professional engineer who signs a report or an engineering plan or specification is personally responsible. The engineer who works for an engineering corporation controlled by bankers or contractors is responsible only to the corporation upon which no equivalent responsibility is imposed by the State.

#### VIOLATION OF CODES OF ETHICS.

"*Fourth.*—The opponents assert that conditions are permitted under which a group, constituted in whole or in part of non-engineers, with impunity may violate the codes of ethics which have been adopted by various professional societies for the guidance of their members and for the protection of the public.

"The proponents of the bill do not reply to this, and it is therefore to be inferred that it is unanswerable. Corporations are free blatantly to advertise and to solicit patronage, while independent engineers are restrained from doing so either by good taste or by professional ethics. In fact, there are well known instances of practices by engineering corporations and unrestricted partnerships which are in direct violation of the professional ethics to which some of their officers or members in their individual capacities have subscribed. This is unfair

to the independent engineer and destructive of that high respect for the profession which is of public concern.

#### INFERIORITY COMPARED WITH OTHER STATES.

*Fifth.*—The opponents call attention to the fact that the holder of a license issued by this State is placed on a plane inferior to that existing in seven of the ten other States of the Union in which licenses to practice the profession are now required, and on a plane inferior to that existing in Canada.

"The proponents of the bill avoid touching on this feature and, consequently, may be assumed to find it unanswerable. It places licensees in this State at a distinct disadvantage when applying for the right to practice elsewhere. As time goes on, and more States adhere to the view which we advocate, the status of the engineers of New York will become increasingly unenviable, unless we set our faces against the practice of engineering by corporations and unrestricted partnerships, made up in whole or in part of non-engineers.

#### LOWERING DIGNITY OF PROFESSION.

*Sixth.*—The opponents state that the dignity and standing of the profession of engineering is lowered by legalizing that which, in the Penal Law and other laws of the State, is stamped as illegal in the cases of law, medicine, dentistry, veterinary surgery and nursing.

"The proponents admit that this point of view would to a certain extent apply if engineering resembled the other professions named; but they say that while law deals with rights and medicine with life, engineering has to do with materials and occupies a field to a high degree less personal than the fields of law and medicine and, inferentially, less than the fields of dentistry, nursing and veterinary surgery.

"If this were true it should be frankly admitted that engineering is a trade devoted solely to money getting, and not a profession in the true meaning of the term, animated by an impartial spirit of service in instructing, guiding and advising others.

"It may be safely assumed that engineers generally will not accept this low valuation placed upon them by the proponents and will not submit to the charge that they are the servants of economics or business, submitted invariably to the test and the involvements of commercial costs. The engineer in directing the forces of nature for the use and benefit of man is a leader in the highest sense and a trustee of the savings entrusted to him by his client, the public. He must be as faithful to the principles of justice and as observant of the sacredness of human life as members of the other professions. In fact, the very purpose of the license law is to serve these ends.

"If it is true, as asserted by the proponents, that the ethics of engineering revolve about a different axis from the ethics of Law and Medicine, it is high time that engineers took a stand against the practice of their profession by corporations which have such a low conception of its obligations.

#### DETRIMENTAL TO PUBLIC INTEREST.

*Seventh.*—The opponents consider that the bill is detrimental to public welfare in that it tends to force engineers in independent practice to abandon their purely professional work and affiliate with contracting or banking organizations, thus depriving the public of the disinterested and effective service of the men who hitherto have been chiefly responsible for the progress of the engineering art.

"The proponents' reply to this is to the effect that it is desirable and necessary, in the public interest, that the engineer who is identified with the creating of large and complicated projects shall associate himself with monied and business groups, in order that he may have greater pecuniary and legal responsibility, especially in connection with cost-plus (assured profit) contracts for

which a special plea is made, and in order that he may be better fitted for commanding a force of specialists.

"From a policy of this kind, with no inhibition on interlocking directorates as in the case of common carriers, organizations are to be expected in which the engineer shares with his non-engineer associates in the distribution of his purely professional fee, and in addition shares in the bankers', manufacturers' or contractors' profits flowing from the execution of the work which he initiates, investigates, plans and directs.

"It would seem that merely to state this proposition is to condemn it as utterly opposed to public interest. No man can even-handedly serve two or more masters; neither is wealth a necessary possession of the professional man in giving efficient and honorable service to his fellows, no matter how large or complicated may be the problem.

"The proponents of the bill themselves have raised several points which require answers:

#### FINANCIAL LOSS TO EXISTING ORGANIZATIONS.

"It is stated that the elimination from the license law of the clause that permits corporations and unrestricted partnerships to practice engineering would put existing concerns of that nature into the hands of receivers.

"It is, of course, understood that partnerships embracing engineers only will in no manner be affected, any more than they are so affected in the other States of the Union where there is no special reference to this matter in their license laws. Several engineers united in a partnership from which non-engineers are excluded naturally have the right to refer to themselves in the plural sense if they are properly licensed. It is the unrestricted partnerships embracing non-engineers as well as engineers that, in company with engineering corporations and joint stock associations, would have to effect changes on or before May, 1922. This would not necessarily mean receiverships. Where there is a will there is a way to bring about the separation of professional and business functions without financial hardship.

"The opponents of the bill have no desire to prevent any proper professional practice by engineers eligible to license under the existing law. On the contrary, they seek not only to protect the public and the profession by definitely fixing responsibility, but also to secure for all professional engineers a just recognition and prevent the exploitation of the profession by banking or commercial interests.

#### CHANGES IN "MODEL BILL".

"The proponents affirm that the position taken by the opponents is contrary to the provisions of the Model Bill (so-called) of Engineering Council, and the impression is given that in so doing the opponents of the bill are running counter to the engineering sentiment of the country.

"That the so-called Model Bill in all particulars is not to be considered as sacrosanct is proven by the proponents' own many departures from its provisions; by dissimilarities in the drafting of license bills in the other States; and by the action of the American Institute of Consulting Engineers, the New York Chapter of the American Society of Civil Engineers and the New York Chapter and State Assembly of the American Association of Engineers, in voicing their protest against the provision that sanctions the practicing of engineering by non-engineers.

"It should be realized that the so-called Model Bill is the product of a few minds, acting in committee, and that it has not been considered in detail and passed upon by the society memberships. The engineering societies above named, we believe, are the only ones which have taken action since the issue of Senate Bill 147716 was raised in this State. If this bill be now vetoed and time thus afforded for investigation and action by other National and State engineering societies, we regard it as practically certain that a great majority of the mem-

bership of every professional engineering society will be found in opposition to the bill.

#### CONCLUSION.

"In bringing this letter to a close it would seem pertinent to quote as follows from N. J. Ware's 'The Creative Ideal':

"Our common characteristic is that we are all, in greater or less degree, creators. And our protest is against the increasing dominance of those who are merely owners and exploiters. What we experience is a renaissance of the creative spirit trying to throw off the spirit of the nineteenth century, the spirit of possession. \* \* \* What is the difference between building a church and preaching in it? The difference is simple, of course. In the case of the professions, control has remained in the hands of the creator and reward has remained a by-product of service. In the case of business, control has long since passed out of the hands of the producer, master, journeyman, artist, inventor, and into the hands of the owner *per se*, the exploiter, the speculator, and service has become the handmaiden of profit. \* \* \*

"The professional classes—the physician, the clergyman, the teacher, the librarian, the journalist—are increasingly conscious of the pressure. The architect cannot fail to see the unmistakable link between his enforced idleness of the past two years, when building was urgently needed, and the amazing revelations of the Lockwood Committee in New York State that all construction materials are controlled by small groups in the interest of neither housing, nor general business, nor the public, nor the community, nor even their own *reasonable* benefit, but for their own extraordinary, incredible, manifold, skyrocketing profit. The engineer, in the face of evident and needed projects for liberating vast forces of nature for the use of mankind, has long felt the oppression of pathetic dependence on the financier's O. K., judged by the latter not in terms of service, not even in terms of profit to himself, but of *sufficiently great* profit. And herein lies the issue around which the new and better world will recrystallize.'"

#### The Amendments to the New York Law

In spite of the foregoing appeal for the veto of the amended Act passed by the New York legislature, Governor Miller signed the revised bill on May 6th, 1921, to take effect on that date. The principal revisions of the previous law\* are as follows:

The second paragraph of Section 37, which provides that licenses are not necessary for individuals, firms or corporations for practice connected with property owned or leased by them unless the same involves the public safety or health, is omitted.

In Section 38 the words "or as soon as possible thereafter", are added to the requirement that the State Board of Licensing shall be appointed by the Regents of the University of the State of New York within 60 days after the Act becomes effective.

In Section 39 the following provision is inserted: "Each member of the Board first created shall receive a certificate of license under this Act from the Regents of this State, and thereafter appointees to the Board shall be licensed professional engineers" to amplify the similar provision in the original Section 39-a.

*Section 39-d. Records and Reports.*—The word "license" is substituted for "registration"; the roster is to be prepared in January, instead of December, of each year; and a new provision that a copy is to be mailed to each licensee is added.



*Section 39-e. Applications for and Issuance of Certificates.*—A clause in regard to the fee for licenses is inserted, as follows: "Except as hereinafter provided". The requirement that the applicant must have had responsible charge of work as assistant for at least one year in addition to four or more years of practice, is omitted.

The provision for the issuance of a certificate to persons who hold like certificates from other States is revised as follows:

"2.—To any person who holds an unexpired certificate of license issued to him or her by a legally constituted board of examiners in the District of Columbia or in any State or territory of the United States in which the requirements for the license or registration of professional engineers or land surveyors are of a standard not lower than those prescribed in this State, provided that an agreement of reciprocity in the matter of indorsement of such certificates of license shall have been entered into between the Regents of the University of the State of New York, the Board of Examiners of this State and the like duly constituted authorities in the District of Columbia or in any other State or territory of the United States."

The following new section provides for the renewal of certificates:

*"Section 39-g. Expiration and Renewal of Certificates.*—Such certificates shall expire on the last day of the month of December following their issuance or renewal, and shall become invalid on that date unless renewed; provided, however, that certificates issued between December 1st and December 31st in any year shall not expire until December 31st of the year following. It shall be the duty of the Secretary of the Board to notify by mail every person licensed hereunder of the date of the expiration of his or her certificate, and the amount of the fee required for its renewal for one year; and such notice shall be mailed at least one month in advance of the date of the expiration of said certificate. Renewal may be effected at any time during the month of December by the payment of a fee of \$1.00 to the Secretary of the Board. The failure on the part of any licensee to renew his certificate annually in the month of December as required above shall not deprive such person of the right of renewal thereafter, but the fee to be paid for the renewal of a certificate after the month of December shall be increased 10% for each month or a fraction of a month that payment for renewal is delayed; provided, however, that the maximum fee for a delayed renewal shall not exceed twice the normal fee."

*Section 39-h. Revocation and Reissue of Certificates.*—This is Section 39-g of the original law, revised by changing the requirement that the Regents shall immediately notify the clerk of each incorporated city, town, village, and county of the revocation or reissuance to read that notification shall be made within thirty days to the clerk of each county only. The charge of \$1.00 for the reissuance of a lost, destroyed, or mutilated certificate is raised to \$10.00.

*Section 39-k. Exemptions.*—This is Section 39-j of the original Act, except that practice of non-residents having no established place of business in the State is exempted "when such practice does not aggregate more than thirty days in any calendar year" (which is a new provision) provided that they are legally qualified for such practice in their own State or country, the further requirement "where the necessary qualifications for which in said State or country meet the requirements of the Board of Regents" being omitted. Practice as a "pupil or under the direction of" licensed engineers or land surveyors is permitted by the new Act.

*Section 39-k. Corporations or Partnerships.*—This section is omitted, and replaced by the provisions of Section 39-o as follows:

*"Section 39-o. Construction of this Article.*—Nothing herein shall apply to a corporation, partnership or joint-stock association, provided the person or persons carrying on the actual practice of engineering on behalf of such corporations, partnerships or joint-stock associations shall be licensed engineers, and nothing in this Article shall be construed to apply to the preparation or execution of designs, drawings, plans or specifications for the construction or installation of machinery or apparatus constructed or installed by the corporation, partnership or joint-stock association preparing such designs, drawings, plans or specifications if the supervision of the preparation of any such designs, drawings, plans or specifications, construction or installation shall be under the general direction of a licensed engineer, and nothing in this Article shall be construed as prohibiting licensed professional engineers from making land surveys, where such surveys are essential to engineering projects, nor as prohibiting any person from surveying land in parcels more than one acre in area when the same is not within the boundaries of cities or incorporated villages, provided such person does not represent or hold himself out as being a licensed land surveyor."

The section on land surveying is revised as follows:

*"Section 39-m. Land Surveying.*—Land surveying for the purposes of this article means the survey of areas for their correct determination and description, and for conveyancing when that is involved, or for the establishment or re-establishment of land boundaries and the plotting of lands and subdivisions thereof."

The following Section 39-n has been added to define Professional Engineering:

*"Section 39-n. Professional Engineering.*—A person practices Professional Engineering within the meaning and intent of this Article, except as hereinafter stated, who holds himself out as able to do, or who does, the work that an engineer does in the planning, designing, constructing, inspecting and supervising of engineering work, or appliances involved in public or private projects, or in making investigations for proposed engineering projects."

This definition of Professional Engineering replaces the definition submitted by members of the State Board of Licensing in the original amendment, as follows:

*"Section 39-n. Professional Engineering.*—Professional Engineering as governed by this Act means the practice of the Professional Engineer who through technical knowledge gained by education and experience in one or more branches of that Profession initiates, investigates, plans and directs the application of the resources of nature to the use and convenience of man; and who represents himself or herself to be such an Engineer, either through the use of the term Engineer with or without qualifying adjectives, or through the use of some other title implying that he or she is such an Engineer."

#### IMPORTANT CHANGE IN PUBLICATIONS

Beginning with the August, 1921, issue, papers and discussions accepted for publication by the Society will be published in *Proceedings*, the size of type page to be 4½ by 7½ in., instead of 4½ by 7½ in., as at present. The next volume of *Transactions* (Vol. LXXXIV) is to include the papers printed with *Proceedings* from August, 1920, to May, 1921, inclusive, together with all discussion thereon.

The foregoing action was taken, on the recommendation of the Publication Committee, by unanimous vote of the Board of Direction at a meeting held in Houston, Tex., on April 26th, 1921.\* The publication of papers and discussions in pamphlet form will, therefore, be discontinued.

\* See page 462.

## BRIEF NOTES

The State of Connecticut, in order to make the motor laws quite clear to every one using its roads, has erected at various important points large painted billboards stating in detail what the motor laws of the State mean when translated into plain English.

The best available data on the strength and related properties of metals and alloys have been collected and published by the U. S. Bureau of Standards in *Circular No. 101*. It includes the tensile strength, proportional limit, percentage of elongation in 2 in., percentage of reduction of area, Brinell and scleroscope hardness of such materials as iron, carbon steel, alloy steels, wire and wire rope, semi-steel, aluminum, copper, etc. In addition, figures are given in some cases for the compressive and shearing strengths and moduli of rupture.

For the first eight weeks of 1921 orders received from the seven associations of the National Lumber Manufacturers Association were 8% in excess of the timber cut for the same period. The total shipments, although not so large as the orders received, exceeded the production by 5 per cent. The total production for this period was 945 106 500 ft. B. M., and the orders were for 1 016 236 358 ft. B. M. These figures represent approximately 50% of normal.

Each year the steam railroads of the United States replace worn tracks with 1 500 000 tons of new rails. In other words, enough old rails are discarded to build a single-track road 10 600 miles long, and if those rails were rolled into a continuous rod 1 in. in diameter it would be long enough to wind around the equator  $9\frac{1}{2}$  times. This immense quantity of scrap metal is not allowed to go to waste, but is worked into many forms—round, square, or hexagonal bars, flats for steel tires, small angle-bars—before it ultimately reaches the furnaces for remelting.

After several years of experimentation, the firm of Krupps in Germany has succeeded in perfecting a process by which large percentages of fuel can be recovered from cinders. This process makes use of the magnetic property which resides in the cinders because of the compounds of iron which they contain. It is stated that in this manner, in the form of coke, no less than 25% of the weight of the cinders can be recovered. Since there is usually an annual consumption of about 100 000 000 tons of coal in Germany, yielding 20 000 000 tons of cinders, the recovery by this process, if generally adopted, might amount to a total of 5 000 000 tons of fuel.

The State Department of Health of New Jersey has been conducting an investigation to determine the effect of the discharge of sewage into the ocean on the quality of water at bathing beaches. The results indicate that the effluent travels approximately parallel to the shore, that the ocean water rapidly dilutes or oxidizes it, and that the surface film of effluent ultimately reaches the surf only after such great dilution that it is of higher bacterial standard than surf water where there are numerous bathers.

The Central Government of China is showing great interest in road building. The Ministry of the Interior, which has charge of highway projects in conjunction with provincial officials, is considering a bill concerning highway development for presentation to the new Parliament. Much road construction work is being conducted in connection with the famine relief work, whereby the recipients

render compensation for the food furnished them and thus contribute to the permanent betterment of China's transportation facilities.

The old method of finding the extent to which a rail has been worn under traffic by taking it out of the road and weighing it, is superseded by the use of a mould of the rail from which a tracing can be made and the weight calculated. A British engineer has introduced the use of plasticine for making the mould and has patented a simple form of nut-cracker apparatus for rapidly obtaining these moulds. They are placed with a piece of sensitized paper in a printing frame, and the area of the photograph thus produced is found by a planimeter, and the weight of the rail calculated.

Owing to the impossibility of finding suitable aggregates and water for concrete along the route of a new highway under construction from Casper to Salt Creek, Wyo., a casting plant has been established at Casper, where these ingredients are available. Slabs about 16 ft. wide, with a thickness of  $6\frac{1}{2}$  in., are cast and transported to the road. About 6 miles of highway have been constructed in this manner. The slabs are of reinforced concrete, the reinforcement being used to strengthen the slab for transportation, they weigh 6 300 lb. each, and are cured for 30 days under proper curing conditions before being placed.

The Board of Trustees of the Armour Institute of Technology has announced the appointment of Howard M. Raymond as Acting President of that Institution, to fill temporarily the vacancy caused by the death of Dr. F. W. Gunsaulus. Acting President Raymond is a graduate of the University of Michigan, and is well known professionally throughout the Middle West. He has been connected with the Institute for the past twenty-six years, and has served as Dean of Engineering since 1903.



## ACTIVITIES OF LOCAL SECTIONS\*

## Ninety-Sixth Regular Meeting of the San Francisco Section

The Ninety-sixth Regular Meeting of the San Francisco Section was held at the Engineers' Club on April 19th, 1921; President F. R. Muhs in the chair; N. A. Bowers, Secretary; and 75 members and guests present.

Mr. T. H. Means, Chairman of the Legislative Committee, reported the activities of that Committee, and stated that Messrs. Galloway and Wadsworth had appeared for the Section before the State Legislative Committee which had the Marshall plan under consideration.

Mr. N. D. Baker reported for the Excursion Committee that the Sacramento River inspection trip had been attended by 126 members and guests, who started at Colusa on April 3d for an all-day boat trip down the Sacramento River. In acknowledgment of his hospitality, Mr. F. D. Monckton, owner of the dredge *America*, was presented with a silk banner bearing the monogram of the San Francisco Section and a suitable inscription.

The Section was urged strongly to oppose the passage of the State Assembly Bill No. 1300, which would abolish the inspection of steam boilers in the State. A resolution disapproving the bill was read and referred to the Legislative Committee with power to act.

President Muhs, in calling attention to the Annual Convention of the Parent Society at Houston, Tex., outlined the work done by the Committee on Referred Amendments, and called on Mr. E. J. Schneider, a member of that Committee, for a brief report. Mr. Schneider reviewed the proceedings of the Committee and explained the features of the proposed revised Constitution. The following resolution was duly moved, seconded and unanimously carried:

*"Resolved:* That the San Francisco Section of the American Society of Civil Engineers in regular meeting assembled on the nineteenth day of April, 1921, after open discussion of the proposed Constitution and By-Laws of the Society submitted by the Committee on Referred Amendments, hereby records its general approval of the document as published, without prejudice to amendment in minor particulars, and extends its unqualified commendation to the Committee for its painstaking and eminently practical efforts to simplify and strengthen the fundamental law of the Society."

On motion of Mr. W. L. Huber, the following resolution was also unanimously carried:

*"Resolved:* By the San Francisco Section of the American Society of Civil Engineers that the members of the Section are dissatisfied with the present form of *Proceedings* and of current papers and discussions; and that the Secretary of the Section be instructed to express to the Board of Direction and to the Publication Committee of the Parent Society the dissatisfaction of the membership of the Section and to request that *Proceedings*, current papers and discussions be issued in a form similar to that so successfully used prior to August, 1920, and that the change be made at an early date."

President Muhs announced as a Committee on Society Affairs, Messrs. H. H. Wadsworth, Chairman, E. T. Thurston, and A. J. Grier, and as the Excursion Committee Messrs. N. D. Baker, Chairman, E. L. Cope, and R. A. Monroe.

\* For list of Local Sections, Officers, Meetings, etc., see p. 554.

The speaker of the evening, Mr. W. L. Huber, addressed the Section on the subject of "Hydro-Electric Developments of the Southern Sierras System." His address was devoted principally to the extensive hydro-electric developments of the Southern Sierras Power Company and its related company, the Nevada California Power Company, and was illustrated by lantern slides including some of the finest views of the High Sierras. He discussed the unusual conditions of stream flow encountered on streams fed almost exclusively from drainage basins of extremely high elevation, and the difficulties and problems of construction and operation in some of the most remote and inaccessible regions of the West, enlivening his talk by many interesting and humorous incidents. In closing, Mr. Huber paid tribute to the work of Mr. C. O. Poole, Chief Engineer of the System since its inception.

#### **Regular Meeting of Cincinnati Section**

A regular meeting of the Cincinnati Section was held at the Engineers' Club on April 4th, 1921; President E. D. Gilman in the chair; A. M. Westenhoff, Secretary; and 12 members present.

A report of the committee appointed to make a recommendation regarding the proposed revised Constitution of the Parent Society, recommending that it is not desirable to request the Committee on Referred Amendments to consider a reduction from the present representation of District No. 1, was read. The report was accepted.

The Committee on Affiliation with the Engineers' Club of Cincinnati reported progress and urged affiliation. After extensive discussion, it was regularly moved, seconded and carried that the Cincinnati Section affiliate with the Engineers' Club of Cincinnati, and that the officers of the Section take the proper steps to consummate such action.

It was duly moved, seconded and carried that a membership committee be appointed, and President Dilman appointed Messrs. M. B. Case, Chairman, R. W. Bame, and C. I. Grimm.

The election of the following officers was announced:

President, E. D. Gilman; Vice-President, G. M. Braune; Secretary-Treasurer, A. M. Westenhoff.

The President reappointed as a Programme Committee Messrs. E. I. Brown, Chairman, G. M. Braune, and G. D. Brooke.

The speaker of the evening, Mr. William Hall, described in detail the Ohio River improvements, including many interesting points in connection with the design and construction of a large number of dams across the Ohio River.

#### **Regular Meeting of Colorado Section**

The 117th Regular Meeting of the Colorado Section was held at the Shirley Hotel on April 11th, 1921; President O. T. Reedy in the chair; John S. Means, Secretary; and 14 members and 3 guests present.

Letters from Senators and Congressmen in reply to the letter concerning the appointment of an engineer to the Interstate Commerce Commission sent in accordance with previous action of the Section, were read. A communication from

E. B. Cushing, Chairman of the Local Committee of Arrangements for the 1921 Annual Convention at Houston, Tex., was read, and President Reedy urged all who could to attend the Convention.

The Chairman of the Committee on Classification and Compensation of Engineers reported progress.

The speaker of the evening, Mr. Stanley H. Browne, of the American Gas Accumulator Company, described the use of intermittent signal devices, illustrating his address by numerous pictures and lantern slides. He explained the block signal system used in England and France, many of the elaborate lighthouses in use in Europe and other foreign countries, the operation of buoys, and the adaptation of the lighthouse principle to highway and traffic signals.

Among the interesting facts stated by Mr. Browne are the following: The average lighthouse costs about \$1 000 000; lighthouses, in general, flash out the Morse code; lighthouse lenses are made abroad; the largest lighthouse is in Hawaii; in the United States there are nineteen lighthouse districts, all of which are east of Iowa. The strength of the new bullet-proof glass to be used in road and traffic signals was demonstrated by dropping on the floor, hammering it with metal, and other severe tests. In conclusion, Mr. Browne stated that an effort was being made by the Company to place on top of Pike's Peak a huge flashing signal to throw rays of light for 150 miles.

#### Annual Meeting of Louisiana Section

The Annual Meeting of the Louisiana Section was held in New Orleans, La., on April 13th, 1921; President A. T. Dusenbury in the chair; E. F. Deléry, Secretary; and 10 members present.

The election of the following officers was announced:

President, Ole K. Olsen; Second Vice-President, E. H. Coleman; Secretary, F. A. Muth; Treasurer, C. N. Bott; members of the Board of Direction, Messrs. A. M. Shaw and A. T. Dusenbury.

The following resolution, on motion, duly seconded, and unanimously carried, was ordered to be sent to the Annual Convention of the Parent Society at Houston, Tex., April 27th-30th, 1921, and read from the floor:

*"Whereas, it appears to be generally recognized that the present Constitution of the American Society of Civil Engineers has been outgrown by the Society; and*

*"Whereas, several past efforts for its improvement have met with defeat largely because of differences of opinion on relatively unimportant details in the proposed amended Constitutions; and*

*"Whereas, there is now before the Society an amended Constitution and By-Laws which in its main essentials is a distinct improvement upon the existing Constitution; now, therefore,*

*"Be it Resolved: That the Louisiana Section of the American Society of Civil Engineers in Annual Meeting assembled hereby endorses and approves the proposed amended Constitution and By-Laws, and recommends to the Annual Convention to be held in Houston, Tex., on April 27th, 28th, and 29th, 1921, that the said amended Constitution and By-Laws be passed to letter-ballot."*

A letter from Acting Secretary H. S. Crocker of the Parent Society relative to the need of an official directory of engineers, similar to "Who's Who in America",

was read. It was the unanimous opinion that there was no need for this publication, and the Secretary was instructed to notify Acting Secretary Crocker to that effect.

### Regular Meeting of Duluth Section

A regular meeting of the Duluth Section was held on April 18th, 1921; Vice-President J. L. Pickles in the chair; W. G. Zimmermann, Secretary; and 21 members and 1 guest present.

Mr. C. de B. Christie, Chairman of the Committee on the Appointment of an Engineer on the Interstate Commerce Commission, submitted a report which, on motion, duly seconded and carried, was adopted.

A letter from Acting Secretary H. S. Crocker on the relation of the Society to the American Engineering Standards Committee, was read, and referred to a committee consisting of Messrs. Hawley, Bryan, and Ayres.

A letter from the American Institute of Consulting Engineers in regard to the licensing bill before the New York State Legislature was referred to a committee consisting of Messrs. Coe, Taylor, and Darling.

A copy of the resolution received from the Portland Section in regard to the publication of technical papers and discussions in *Proceedings* was read. On motion, duly seconded and carried, the Secretary was instructed to prepare a similar resolution and send it to the Board of Direction of the Parent Society.

The speaker of the evening, John I. Quinn, M. Am. Soc. C. E., Bridge Engineer of St. Louis County, Minnesota, presented a brief address on the work done by that County in highway bridge construction during the past two years.

### Regular Meeting of Pittsburgh Section

A regular meeting of the Pittsburgh Section was held on March 21st, 1921; Vice-President J. N. Chester in the chair; Nathan Schein, Secretary; and present, also, 40 members.

A committee appointed to study the proposed National Water Power Act and the Committee on External Relations reported progress.

Mr. C. S. Davis offered the following resolution, which was duly seconded and unanimously carried:

"Whereas, the Mayor of the City of Pittsburgh on March 15th, 1921, summarily dismissed Mr. N. S. Sprague from the position of Chief Engineer of the Bureau of Engineering of said City; and

"Whereas, said position was held by Mr. Sprague for a period of fourteen years with credit to the city, the Profession and himself, as shown and demonstrated by the work accomplished under his supervision during the period of his incumbency; now, therefore,

"Be It Resolved: That the Pittsburgh Section of the American Society of Civil Engineers express its confidence in the professional ability and integrity of Mr. N. S. Sprague; and

"Be It Further Resolved: That his dismissal should not be construed as reflecting upon his professional ability and reputation; and

"Be It Further Resolved: That a copy of this Resolution be sent to the Parent Society with the request that it be placed in the records and published in the *Proceedings*, and that copies be sent to Mr. N. S. Sprague, Mayor E. V. Babcock, the City Council, and the local press."



Mr. Davis presented the report of the Committee appointed to examine the proposed Act to Regulate the Practice of Professional Engineering and Land Surveying in the State of Pennsylvania, which concluded with the following recommendations:

- "1.—The term 'Engineer' should be defined.
  - "2.—Section 3 states that after a certain date it shall be unlawful for any person to practice or offer to practice professional engineering. A study should be made to ascertain if this should be extended to include 'firm or corporation'.
  - "3.—All members of the Board should be Professional Engineers.
  - "4.—The Secretary should not be a member of the Board.
  - "5.—Branches of engineering should be defined.
  - "6.—A quorum of the Board should consist of not less than four members.
  - "7.—Provisions should be made to furnish copies of the roster to all Registered Engineers and Land Surveyors and to others desiring copies.
  - "8.—A yearly fee should be required to keep a license in force.
  - "9.—Foreign engineers should be required to pay an annual fee.
  - "10.—Registered Engineers and Land Surveyors should be limited to citizens of the United States and Canada.
  - "11.—All plans, plats and reports should be required to be stamped with the seal of the Registered Engineer or Land Surveyor preparing the same.
- "Recommendations: That the Pittsburgh Section send a representative to Harrisburg to work with delegates from other sections of the State to amend the Act as suggested in this report, and to support the Act as amended along this line."

It was moved, seconded, and unanimously carried that the report be accepted, and Mr. Davis was named as the delegate to go to Harrisburg, Pa., as recommended.

B. F. Groat, M. Am. Soc. C. E., addressed the Section on the subject of "Code of Ethics and Professional Standards". The address was favorably received, and the Executive Committee ordered that it be sent to the Parent Society with the request that it be published in *Proceedings*.

## ACTIVITIES OF STUDENT CHAPTERS\*

### Installation of Purdue University Student Chapter

The formal installation of the Purdue University Student Chapter of the Society took place at a banquet in the Hotel Fowler, La Fayette, Ind., on April 5th, 1921; 108 members of the Purdue Society of Civil Engineers were present, and automatically became charter members of the new Chapter. Dean A. A. Potter, of the School of Engineering, Dr. W. E. Stone, President of the University, the heads of other Engineering Departments, and the Presidents of the Student Professional Societies, were present as guests.

Dr. W. K. Hatt, Head of the School of Civil Engineering, as toastmaster for the evening, presented in the opening address a short history of the Purdue Society of Civil Engineers and its accomplishments, and a summary of the circumstances leading to the formation of a Student Chapter of the American Society of Civil Engineers. President Stone and Dean Potter responded to toasts, each emphasizing the new obligations that should be assumed by engineers in public life, and the need for engineers in public office. Dean Potter expressed his satisfaction at the advance made by the civil engineering students in joining a National organization.

\* For list of Student Chapters, Officers, etc., see p. 557.

Ira O. Baker, M. Am. Soc. C. E., Head of the Civil Engineering Department of the University of Illinois, delivered the address of the evening, on the subject "New Engineering Ideals";\* which was received with great appreciation.

Short addresses of welcome were made by the Presidents of the Student Chapters of the American Institute of Electrical Engineers and the American Society of Mechanical Engineers, and Mr. D. A. Leach, President of the new Student Chapter of the American Society of Civil Engineers, gave a short resumé of the advantages offered to members by affiliation with National organizations.

\* Reproduced in full on p. 510.

EMPLOYMENT BULLETIN  
POSITION AVAILABLE

The owner with a large building and  
other structures, and with a large  
amount of work to be done, is looking  
for a competent and experienced  
person to take charge of the work.

THE ASSOCIATE ENGINEER OF CIVIL ENGINEERING  
The owner with a large building and  
other structures, and with a large  
amount of work to be done, is looking  
for a competent and experienced  
person to take charge of the work.  
The owner with a large building and  
other structures, and with a large  
amount of work to be done, is looking  
for a competent and experienced  
person to take charge of the work.

TWO THE ASSOCIATE ENGINEER OF CIVIL ENGINEERING  
The owner with a large building and  
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person to take charge of the work.

ASSOCIATE ENGINEER OF CIVIL ENGINEERING  
The owner with a large building and  
other structures, and with a large  
amount of work to be done, is looking  
for a competent and experienced  
person to take charge of the work.

NEW AVAILABLE

owner and with large purchase of  
real estate and property, and  
other structures, and with a large  
amount of work to be done, is looking  
for a competent and experienced  
person to take charge of the work.

CIVIL ENGINEER college graduate, experience  
in design and construction of  
industrial structures, and with a large  
amount of work to be done, is looking  
for a competent and experienced  
person to take charge of the work.

## ENGINEERING SOCIETIES SERVICE BUREAU

An Engineering Societies Service Bureau was established December 1st, 1918, as an activity of Engineering Council, managed by a board made up of the Secretaries of the four Founder Societies, funds for its maintenance being provided by these Societies. The Bureau is co-operating with engineering organizations in all parts of the country. It is desirous of increasing such co-operation by working with local engineering associations and clubs. Members of the American Society of Civil Engineers who desire to register with this Bureau should apply for further information, registration forms, etc., to Walter V. Brown, Manager, Engineering Societies Service Bureau, First Floor, Engineering Societies Building, 29 West 39th Street, New York City. In order to be included in the list published in *Proceedings*, copy must be received on or before the first Wednesday of each month. All communications should be addressed to Mr. Brown.

## EMPLOYMENT BULLETIN

## POSITIONS AVAILABLE

**JUNIOR ENGINEER AND DECK OFFICER,** U. S. Coast and Geodetic Survey, examination July 6th and 7th, 1921; entrance salary \$2 000 per year, increased to \$2 240 after one month if service is satisfactory. About 50 vacancies are to be filled from eligibles resulting from this examination; after a probationary period of six months, successful appointees will be commissioned by the President at a salary of \$2 500. Subjects and weights: (1) mathematics, including trigonometry, analytics, mechanics, and calculus, 15; (2) practical computations, 20; (3) modern language, 10; (4) astronomy, especially determination of latitude, longitude, time, and azimuth, and use of field instruments, 20; (5) physics—optics, magnetism, etc.—15; (6) surveying, plane and geodetic, 20. Time allowed, two days of six hours each: (1), (2), and (3) on the first day and (4), (5), and (6) on the second. Slide rule allowed and logarithmic tables furnished. Prerequisite: Graduation from college, university, or technical school of recognized standing with degree of B. S. in Civil Engineering, or C. E. Physical examination required, also photograph on day of examination.

**ASSISTANT OR ASSOCIATE PROFESSOR.** Must be technical graduate with successful teaching and practical experience. Position open September, 1921. Location Northwest. X-399.

**THREE INSTRUCTORS;** teaching experience desirable, but not essential. Should have had some experience in practice of civil engineering. Duties will cover subjects of surveying, hydraulic laboratory, testing materials laboratory, sanitary engineering. Position open September 1st. Location Middle West. X-448.

**SALESMEN,** to sell building proposition as a side line. Men traveling in New England, Middle West, Middle Atlantic States, and

the South with a steady position and clientele preferred. Men selling in New York City also considered. Write for appointment. Salary-commission basis. X-457.

**SURVEYOR DRAFTSMAN FOR FOREST SERVICE.** The field surveying involved is the work of land classification, reconnaissance of the National Forest resources, outlining boundaries of land claims where considerable precision is required, making surveys for road location, supervising construction, and the like. Duties as draftsman are much more than those ordinarily required of draftsmen, and include supervision or field inspection of both surveying and mapping done by estimating crews. Purpose of combining the two positions is to provide that the employee shall be able to compile the field data during the winter months on finished maps and thereby insure constant employment, and not merely seasonal, as surveying work alone often is. Eligibles are expected to have general qualifications outlined, and selection is largely determined by training and experience required in the particular position to be filled. Location Washington, D. C. X-458.

**TWO OR THREE INSPECTORS** for steel water pipe, qualified to pass on quality of riveting, caulking and assembling of riveted joints. Should be experienced, preferably in steel tank work or boiler work, and will be used as field inspectors. Location, Michigan. X-480.

**ASSISTANT PROFESSOR OF CIVIL ENGINEERING** to teach mechanical drawing, surveying and courses in railway and highway engineering, his services to begin about the middle of next September. Should be graduate of course in Civil Engineering and possibly not over thirty-five years old, and should have some teaching and some practical experience. Location South. X-482.

## MEN AVAILABLE

**CIVIL ENGINEER,** college graduate, seventeen years of practical experience in design and construction of power developments, shops, industrial plant, housing propositions,

sewer and water lines, purchase of materials, reports and appraisal work. Highest references. Location immaterial. CE-150.

**CIVIL ENGINEER**, Assoc. M. Am. Soc. C. E., graduate, married. Ten years' high grade experience; nine years' responsible charge, city and county engineering design, construction, investigations, surveys; one and one-fourth years' railroad maintenance-of-way surveys; four years' draftsman and designer, structural steel and industrial plant maintenance, steel frame and reinforced concrete structures, coal and ore handling machinery and storage, producer gas and steam power plants. Responsible charge more or less for about one and one-half years. Permanent position desired. Location North Central States. CE-151.

**CONSTRUCTION OR RESIDENT ENGINEER**, age 35; Assoc. M. Am. Soc. C. E. Fifteen years' experience on hydro-electric developments, pneumatic caissons, heavy concrete foundations, power houses, sub-stations, factory buildings, etc. Technical graduate. Willing to go anywhere; available at once. CE-152.

**ENGINEER EXECUTIVE**, twelve years' experience in railroad and building construction. For past four years and at present time employed by steel shipbuilding company as plant engineer in charge of design, construction, equipment and maintenance of yard and buildings. Work has included: Construction of reinforced concrete shipways, warehouse, office buildings, and steel crane runways, structures supported by reinforced concrete or timber pile foundations, also several heavy timber pile piers and concrete bulkheads; superintendence of erection of several thousand tons of structural steel and large capacity cranes and complete finishing and furnishing of electrical, heating and plumbing installations for buildings; equipment and maintenance of shops and buildings; large dredging operations, including hydraulic fill. Prefers connection with progressive concern as sales engineer for materials in reinforced concrete construction, or as executive with contractor doing large work in reinforced concrete building construction. CE-153.

**FOREIGN REPRESENTATIVE**. A Member of the Society, formerly general attaché of German legation at Washington, D. C., who speaks French, Spanish, Italian, Swedish, English and German, wants to represent in Berlin and Europe American interests of American manufacturer or patents of American concern. CE-154.

**CONSTRUCTION ENGINEER**, Assoc. M. Am. Soc. C. E., technical graduate, age 35. Twelve years' experience on projects of considerable magnitude. Excellent references, capable executive and organizer. Hydro-electric, hydraulic fill, sewer, roads, paving, municipal, and contracting experience. Open for immediate engagement with contracting or engineering firm. CE-155.

**CIVIL ENGINEER GRADUATE**; twenty years' broad practical engineering and contracting experience on water-works, sewers, highways, hydraulics and general engineering, with utility holding companies, consulting engineers and contractors in investigations, design, construction, appraisals. Will consider any proposition, engineering or associated work. Excellent references from all with whom ever associated. Prefer Middle Atlantic States for permanency. Eastern interview. CE-156.

**EXECUTIVE ENGINEER**; graduate with eleven years' engineering, sales development and purchasing experience throughout the world and with office facilities in New York, can undertake New York representation, or commissions requiring not more than half time. Cost-plus or commission basis. M. Am. Soc. C. E., and Am. Inst. M. E. Married; age 33. CE-157.

**EXPERT STRUCTURAL ENGINEER** wishes position in charge of structural department with leading architect, engineer or industrial corporation in New York City. CE-158.

**SALES ENGINEER** with an established office in New York City and extensive acquaintance in the Metropolitan District among contractors and architects, with whom he is keeping in constant touch, desires to represent manufacturer interested in reaching this trade personally. CE-159.

**ASSOCIATE MEMBER** Am. Soc. C. E., age 33; graduate engineer desires position as an executive engineer, city manager, county engineer, city engineer, resident or field engineer with some State Highway Department. Large surveying and estimating experience; also construction. Was Major of Engineers in the late war, rising from the grade of 1st Lieut.; good organizer, not afraid of work. Must have work, for financial depression has affected him seriously. CE-160.



### ANNOUNCEMENTS

The Reading Room of the Society is open from 9 A. M. to 6 P. M., and from 7 P. M. to 10 P. M., every day, except Sundays, New Year's Day, Washington's Birthday, Memorial Day, Fourth of July, Labor Day, Thanksgiving Day, and Christmas Day; during July and August, it is closed at 6 P. M.

### FUTURE MEETINGS

June 1st, 1921.—8.00 P. M.—A regular business meeting of the Society will be held, the programme for which will be announced later.

### SECOND MEETINGS OF THE MONTH

Under authority given by the Board of Direction at its meeting of August 9th, 1920, the Acting Secretary has made an arrangement with the New York Section whereby the latter will take over the second meeting of the month, and will thus hold its own meetings on the third Wednesday of each month, except January and May, when they are held on the second Wednesday.

The programmes announced by the New York Section\* are similar to those heretofore offered by the Society's Committee on Second Meeting of the Month, and it is understood that all members of the Society are invited to attend the meetings regardless of whether or not they may be members of the Section. This arrangement gives each member the same privilege of attendance at meetings which he has heretofore enjoyed, and is deemed especially desirable since there has been considerable doubt as to the attendance that might develop at the several meetings if three were held in each month.

### REGULATIONS FOR STUDENT CHAPTERS

1.—A Student Chapter in affiliation with the American Society of Civil Engineers, composed of students of schools of engineering of recognized reputation, may be organized upon favorable vote by the Board of Direction. The name of such an affiliated society shall be "The.....† Student Chapter of the American Society of Civil Engineers."

2.—The qualifications required of a proposed Student Chapter shall include:

- (a).—An organization of students in an engineering school of high standing;
- (b).—The endorsement of the application by the head of the civil engineering department;
- (c).—A minimum membership of twenty students.

3.—Each Student Chapter shall establish its own rules of government and procedure, which shall conform with any regulations which may be formulated by the American Society of Civil Engineers. It is also intended that each Student Chapter shall control the occurrence and character of its own meetings; but the American Society of Civil Engineers desires especially to aid in promoting the success and value of student chapters by frequent consultations and advice, as well as by arranging for speakers, on request, whose addresses will broadly supplement

\* *Proceedings*, Am. Soc. C. E., November, 1920, p. 868.

† Insert the name of the educational institution at which the particular student chapter is situated; for example, "Stanford University".

the class-work of the members. Each Student Chapter is authorized to communicate direct with the Local Section or local members in whose territory it is situated, to arrange for speakers and for other co-operation.

4.—Each Student Chapter shall submit an annual report, not later than the last day of December of each year, which shall include

(a).—A summary statement of the meetings held during the calendar year; giving the date of each, the attendance, the principal speaker and his subject, and other pertinent information;

(b).—Names of the officers, and of the members by classes, at the date of the report.

5.—Any address or paper read before a Student Chapter may be offered for publication to the American Society of Civil Engineers under the general provisions established for this procedure, and shall be submitted to the Board of Direction when requested by the said Board or when such Chapter desires to publish it in a local journal or elsewhere; it being understood that the privilege of priority in publication exists in the American Society of Civil Engineers, though the Society claims no exclusive copyright upon such papers.

6.—The annual dues of each Student Chapter shall be \$10.00 per year, which, under provisions approved by the Board of Direction, shall entitle it to the following:

(a).—A copy of each issue of the *Proceedings* of the American Society of Civil Engineers and of all papers;

(b).—The opportunity to publish notices of its chapter activities, etc., in publications of the American Society of Civil Engineers;

(c).—The active co-operation of the American Society of Civil Engineers in advancing the interests of each Student Chapter by contributing (from its organization, membership, and experience) such service as may be mutually arranged.

The annual dues shall apply to the current fiscal year and shall be payable in advance, due January 1st. The Secretary of the American Society of Civil Engineers shall send out bills for dues each December for the following year. Student Chapters admitted on or after July 1st of each year shall pay \$5.00 only for the balance of the current fiscal year.

7.—Among the privileges offered to the members of Student Chapters are:

(a).—Individual subscription to the *Proceedings* of the American Society of Civil Engineers at a special price of \$3.00 per year;

(b).—To receive at cost, on request, copies of such separate papers as may be printed in pamphlet form;

(c).—To use on all official stationery the special official emblem, prescribed in Section 8;

(d).—A membership card, of special design, prescribed in Section 9, to be issued annually;

(e).—The right to attend the meetings and accompany inspection trips and excursions arranged for members of the American Society of Civil Engineers;

(f).—Provision for the publication of requests for summer employment during the college course, or for permanent engagement after graduation, on such terms as the Board of Direction may prescribe; and

(g).—The opportunity to hear, on special occasions, speakers whose personal experiences qualify them to speak with authority upon the many questions which are of particular importance to the student during his college course.

8.—The official emblem for stationery for Student Chapters shall be in strict accord with a standard design, as prescribed by the Board of Direction.

9.—The membership cards shall be supplied and signed by the Secretary of the American Society of Civil Engineers, in accordance with official annual lists furnished by the Secretaries of the Student Chapters.

10.—Applications for admission of Student Chapters to the American Society of Civil Engineers shall be in the following form:

(Place.)

(Date.)

"TO THE BOARD OF DIRECTION,  
AMERICAN SOCIETY OF CIVIL ENGINEERS.

"GENTLEMEN: The.....hereby make application for affiliation with the American Society of Civil Engineers as a Student Chapter, under the terms prescribed by the Board of Direction.

"In regard to the qualifications required of a proposed Student Chapter, we submit the following:

"(a).—This.....is composed of.....  
(Seniors, Juniors, Sophomores, Freshmen.)  
..... It was organized.....

(Date.)

"(b).—Our application for affiliation is herewith endorsed by.....  
.....Head of the Department of Civil Engineering.

"(c).—There are at present.....active members of this organization.  
(Number.)

Respectfully yours,

Secretary.

"Endorsed:

"Head of Civil Engineering Department.

"Name of Educational Institution."

11.—A Student Chapter may be disbanded upon the approval of the Board of Direction provided its annual dues for the current calendar year have been paid.

The Board of Direction may discontinue a Student Chapter if its annual dues are not paid promptly, or if it becomes inactive, or if its continuance is considered not for the best interest of the Society.

#### **RULES ADOPTED BY THE BOARD OF DIRECTION FOR THE USE OF THE ADDRESSOGRAPH AND MAILING LIST OF THE SOCIETY**

The following rules were adopted by the Board of Direction at its meeting of November 9th, 1920, for the use of the Addressograph and Mailing List of the Society:

1.—The Addressograph shall be used by the Secretary only in the routine of the issuance of Society matter and for the issuance of notices of joint meetings of this and other societies.

2.—The Mailing List shall be furnished by the Secretary:

(a) To Local Sections of the Society free of charge for legitimate use by them in relation to Society matters, and

(b) To individual members of the Society at cost price for their communication with the membership regarding Society affairs.

3.—Neither Mailing List nor the use of the Addressograph shall be furnished to any one for commercial or advertising purposes.

4.—In the difficulty of prescribing rules to cover each case that may arise in the future, the Secretary is authorized to use his discretion regarding each application as to whether it is in accordance with the spirit of the rules here outlined.

5.—These rules shall be published in the *Proceedings* of the Society so that all members may have an equal chance to avail themselves of the advantages of the use of the Mailing List.

#### **SEARCHES IN THE LIBRARY**

As the Library of the American Society of Civil Engineers has been merged in the Engineering Societies Library, requests for searches, copies, translations, etc., should be addressed to the Director, Engineering Societies Library, 29 West 39th Street, New York City, who will gladly give information concerning the charges for the various kinds of service. A more comprehensive statement in regard to this matter will be found on page 21 of the Year Book for 1921.

#### **PAPERS AND DISCUSSIONS**

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper. Written discussion on a given paper will be closed three months after the paper has been published, so that the author's closure can be printed four months after the paper, and the discussions and closure distributed in pamphlet form.

All manuscripts submitted for publication should preferably be typewritten, and always double spaced. Drawings and diagrams should be on separate sheets, drawn to a scale suitable for about one-half to one-fourth reduction.



All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion will be set down for presentation to a future meeting of the Society, and, on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which from their mathematical or technical nature, in the opinion of the Committee, are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in the same manner as those which are to be presented at meetings, but written discussions only will be requested for subsequent publication and with the paper in the volumes of *Transactions*.

The Board of Direction has adopted rules for the preparation and presentation of papers, which will be found on page 36 of the Year Book for 1921.

### LOCAL SECTIONS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

#### **San Francisco Section, Organized 1905.**

Frederick R. Muhs, President; Nathan A. Bowers, Secretary-Treasurer, 531 Rialto Building, San Francisco, Cal.

Bi-monthly meetings are held at 6 P. M., at the Engineers' Club, 57 Post Street, on the third Tuesday of February, April, June, August, October, and December, the last being the Annual Meeting. Informal luncheons are held at noon, every Wednesday, at the Engineers' Club. All members of the Society will be gladly welcomed.

#### **Colorado Section, Organized 1908.**

Oliver T. Reedy, President; John S. Means, Secretary-Treasurer, 1574 Marion Street, Denver, Colo.

Meetings are held on the second Monday of each month, except July and August, usually preceded by an informal dinner. Weekly luncheons are held on Wednesday, at 12.30 P. M., at Daniels and Fisher's. Visiting members of the Society are urged to attend.

#### **Atlanta Section, Organized 1912.**

J. T. Wardlaw, President; R. S. Fiske, Secretary-Treasurer, 1530 Healey Building, Atlanta, Ga.

Informal luncheons are held on the last Monday of each month, at 12.30 P. M., to which visiting members of the Society are welcome.

#### **Baltimore Section, Organized 1914.**

Ezra B. Whitman, President; George S. Robertson, Sr., Secretary-Treasurer, 1628 Linden Avenue, Baltimore, Md.

#### **Buffalo Section, Organized 1921.**

A. L. Johnson, President; Bruce L. Cushing, Secretary-Treasurer, 80 West Genesee Street, Buffalo, N. Y.

#### **Central Ohio Section, Organized 1921.**

F. H. Eno, President; H. D. Bruning, Secretary, 935 Madison Avenue, Columbus, Ohio.

Meetings are held at the rooms of the Engineers' Club of Columbus in the Southern Hotel. The Annual Meeting is held on the second Friday of November and at least two other meetings are held each year the dates of which are designated by the Board of Direction of the Section.

**Cincinnati Section, Organized 1920.**

Edgar Dow Gilman, President; Alphonse M. Westenhoff, Secretary, 13 East Third Street, Cincinnati, Ohio.

**Cleveland Section, Organized 1914.**

J. E. A. Moore, President; George H. Tinker, Secretary-Treasurer, 516 Columbia Building, Cleveland, Ohio.

Regular meetings are held on the second Wednesday of each month, at 12.15 P. M., in the Rooms of the Cleveland Engineering Society, Hotel Statler. Luncheon is served, and all visiting members of the Society are invited to attend.

**Connecticut Section, Organized 1919.**

Charles Rufus Harte, President; Clarence M. Blair, Secretary-Treasurer, 785 Edgewood Avenue, New Haven, Conn.

The Annual Meeting is held in April; fortnightly meetings alternate between Hartford and New Haven, Conn. These meetings are informal luncheon gatherings, held usually at noon on Saturday. Members are privileged to invite guests regardless of their affiliation as engineers.

**Detroit Section, Organized 1916.**

David A. Molitor, President; Dalton R. Wells, Secretary-Treasurer, 624 McKerchey Building, Detroit, Mich.

Regular meetings are held on the second Friday of December, April, and October, the last being the Annual Meeting.

**District of Columbia Section, Organized 1916.**

John C. Hoyt, President; James H. Van Wagenen, Secretary-Treasurer, 2001 Sixteenth Street, N. W., Washington, D. C.

**Duluth Section, Organized 1917.**

W. A. Clark, President; Walter G. Zimmermann, Secretary, 203 Wolvin Building, Duluth, Minn.

Regular meetings are held at noon on the third Monday of each month, usually at the Kitchi Gammi Club, to which visiting members of the Society will be welcomed. The Annual Meeting is held on the third Monday in May.

**Illinois Section, Organized 1916.**

Charles B. Burdick, President; W. D. Gerber, Secretary-Treasurer, 913 Chamber of Commerce, Chicago, Ill.

Regular meetings are held on the second Monday of March, June, September, and December, the last being the Annual Meeting.

**Iowa Section, Organized 1920.**

C. S. Nichols, President; R. W. Crum, Secretary, Care, Iowa State Highway Commission, Ames, Iowa.

**Los Angeles Section, Organized 1914.**

H. W. Dennis, President; Floyd G. Dessery, Secretary, 619 Central Building, Los Angeles, Cal.

Regular monthly meetings are held on the second Wednesday of each month, the Annual Meeting in December. Informal luncheons in connection with the Joint Technical Societies of Los Angeles are held at 12.15 P. M., every Thursday at the Broadway Department Store Café.

**Louisiana Section, Organized 1914.**

Ole K. Olsen, President; F. A. Muth, Secretary, 224 Custom House Building, New Orleans, La.

Regular meetings are held at The Cabildo, New Orleans, La., on the first Monday of January, April, July, and October.

**Nashville Section, Organized 1921.**

Arthur J. Dyer, President; Granbery Jackson, Secretary-Treasurer, 220 Capitol Boulevard, Nashville, Tenn.

**Nebraska Section, Organized 1917.**

Rodman M. Brown, President; Homer V. Knouse, Secretary-Treasurer, 200 City Hall, Omaha, Nebr.

Regular meetings are held on the first Saturday of each month, except July and August. The Annual Meeting is held in Lincoln, Nebr., on the second Friday in January. Visiting members of the Society are especially urged to communicate with the Secretary when in the city.

**New York Section, Organized 1920.**

William J. Wilgus, President; W. T. Chevalier, Secretary, 17 Battery Place, New York City.

Regular meetings are held in the Engineering Societies Building, 29 West 39th Street, New York City, on the third Wednesday of each month, except January and the Annual Meeting in May, held on the second Wednesday of the month.

**Northwestern Section, Organized 1914.**

Charles L. Pillsbury, President; Paul C. Gauger, Secretary, 945 Osceola Ave., St. Paul, Minn.

Meetings are held bi-monthly, alternating between St. Paul and Minneapolis, on the third Friday of each month.

**Oklahoma Section, Organized 1920.**

H. V. Hinckley, President; R. E. Brownell, Secretary-Treasurer, 401 First National Bank Building, Oklahoma, Okla.

**Philadelphia Section, Organized 1913.**

John Meigs, President; S. C. Hollister, Secretary, 1200 Land Title Building, Philadelphia, Pa.

Regular meetings are held at the Engineers' Club on the first Monday in January, April, and October, the last being the Annual Meeting. Special meetings are also held at times announced in advance.

**Pittsburgh Section, Organized 1917.**

N. S. Sprague, President; Nathan Schein, Secretary-Treasurer, 1510 Carson Street, Pittsburgh, Pa.

**Portland (Ore.) Section, Organized 1913.**

M. E. Reed, President; C. P. Keyser, Secretary, 318 City Hall, Portland, Ore.

Meetings are held regularly on the third Friday of each month. All members of the Society in any grade are cordially invited to attend.

**Providence (R. I.) Section, Organized 1920.**

Sidney Wilmot, Chairman; Howard W. Congdon, Secretary-Treasurer, Care, Providence Steel and Iron Company, Providence, R. I.

The Section regularly holds meetings jointly with the Structural and Municipal Sections of the Providence Engineering Society, at the Society Rooms, 29 Waterman Street, on the fourth Tuesday of each month, from September to May. The

**Annual Meeting** is held in May. All visiting members of the Society are cordially invited to attend these meetings.

**St. Louis Section, Organized 1888 (Constitution Approved by Board, 1914).**

William S. Mitchell, President; W. R. Crecelius, Secretary-Treasurer, 301 City Hall, St. Louis, Mo.

The Annual Meeting is held on the fourth Monday in November. Two meetings each year for the presentation and discussion of technical papers are held in the Auditorium of the Engineers' Club, and are open to members of the Associated Societies. Other "get-together" meetings are held regularly for dinner or luncheon on the fourth Monday of each month except July, August, and November.

**San Diego Section, Organized 1915.**

George Cromwell, President; R. C. Wueste, Secretary-Treasurer, Bonita, Cal.

The San Diego Section of the American Society of Civil Engineers meets on announcement. Pilgrimages to points of engineering interest are made at intervals throughout the year.

**Seattle Section, Organized 1913.**

T. E. Phipps, President; Frank H. Fowler, Secretary-Treasurer, 1319 L. C. Smith Building, Seattle, Wash.

Regular meetings, with luncheon, are held at the Engineers' Club, on the last Monday of each month. All members in any grade of the Society are cordially invited to attend, and if located in this District for any length of time, their membership in the Section will be appreciated.

**Spokane Section, Organized 1914.**

E. G. Taber, President; Charles E. Davis, Secretary-Treasurer, 401 City Hall, Spokane, Wash.

Meetings are held on the second Friday of each month. These meetings are noonday luncheons at Davenport's, and all visiting members of the Society are invited to attend.

**Texas Section, Organized 1913.**

J. H. Brillhart, President; E. N. Noyes, Secretary, 311 Deere Building, Dallas, Tex.

**Utah Section, Organized 1916.**

W. R. Armstrong, President; H. S. Kleinschmidt, Secretary-Treasurer, 222 Felt Building, Salt Lake City, Utah.

The Annual Meeting is held on the first Wednesday in April. The time of other meetings is not fixed, but this information will be furnished on application to the Secretary.

**STUDENT CHAPTERS OF THE  
AMERICAN SOCIETY OF CIVIL ENGINEERS**

**Stanford University Student Chapter, Organized 1920.**

R. L. Wing, President; U. B. Gilroy, Corresponding Secretary, Stanford University, Cal.

**Alabama Polytechnic Institute Student Chapter, Organized 1921.**

Alfred D. Boyd, Secretary, Alabama Polytechnic Institute, Auburn, Ala.



**Braune Civil Engineering Society (University of Cincinnati) Student Chapter, Organized 1920.**

Clinton H. Wood, President; H. J. Miller, Secretary of Section I; Alvord C. Stutson, Secretary of Section II; University of Cincinnati, Cincinnati, Ohio.

**California Institute of Technology Student Chapter, Organized 1921.**

J. Arthur Macdonald, Secretary, California Institute of Technology, Pasadena, Cal.

**Civil Engineering Society of Rensselaer Polytechnic Institute Student Chapter, Organized 1920.**

E. C. Larson, President; T. W. Broughton, Secretary, 2165 Fourteenth Street, Troy, N. Y.

**Cornell University Student Chapter, Organized 1921.**

John J. Chavanne, Jr., Secretary, Cornell University, Ithaca, N. Y.

**Drexel Institute Student Chapter, Organized 1920.**

Miles N. Clair, Chairman; C. V. Nishwitz, Secretary, Drexel Institute, Philadelphia, Pa.

**Iowa State College Student Chapter, Organized 1920.**

Alfred W. Warren, Secretary, Iowa State College, Ames, Iowa.

**Johns Hopkins University Student Chapter, Organized 1921.**

Eric M. Arndt, President; Melvin E. Scheidt, Secretary, Box 566, Homewood, Baltimore, Md.

**Massachusetts Institute of Technology Student Chapter, Organized 1921.**

T. H. Gill, Secretary, Massachusetts Institute of Technology, Cambridge, Mass.

**New York University Student Chapter, Organized 1921.**

William J. Kiehnle, President; George H. Martin, Jr., Secretary, New York University, University Heights, New York City.

**Oregon State Agricultural College Student Chapter, Organized 1921.**

John B. Alexander, Secretary, Omega Upsilon House, Oregon State Agricultural College, Corvallis, Ore.

**Pennsylvania State College Student Chapter, Organized 1920.**

Arthur H. McFadden, President; William W. Seltzer, Secretary, Pennsylvania State College, State College, Pa.

**Polytechnic Institute of Brooklyn Student Chapter, Organized 1921.**

Richard Kanegsberg, Secretary, Polytechnic Institute of Brooklyn, Brooklyn, N. Y.

**Purdue University Student Chapter, Organized 1921.**

Donald A. Leach, President, 208 Fowler Avenue, West Lafayette, Ind.

**Rose Polytechnic Institute Student Chapter, Organized 1921.**

Kenneth L. De Blois, President; Duncan Baker, Secretary, 1606 North 8th Street, Terre Haute, Ind.

**Rutgers College Student Chapter, Organized 1921.**

Arthur E. Hilliard, Secretary, Winants Hall, Rutgers College, New Brunswick, N. J.

**State University of Iowa Student Chapter, Organized 1921.**

C. E. Stickney, Secretary, State University of Iowa, Iowa City, Iowa.

**Swarthmore College Student Chapter, Organized 1921.**

Edward E. Bartleson, Secretary, Swarthmore College, Swarthmore, Pa.

**Syracuse University Student Chapter, Organized 1921.**

Arthur V. Dollard, Secretary, College of Applied Science, Syracuse University, Syracuse, N. Y.

**University of Colorado Civil Engineering Society Student Chapter, Organized 1920.**

W. C. Peterson, President; D. H. McNeal, Secretary, 1205 Thirteenth Street, Boulder, Colo.

**University of Kansas Student Chapter, Organized 1921.**

B. C. Judkins, President; Seth P. Kingman, Secretary, 1125 Kentucky Street, Lawrence, Kans.

**University of Kentucky Student Chapter, Organized 1921.**

B. O. Bartee, Secretary, University of Kentucky, Lexington, Ky.

**University of Maine Student Chapter, Organized 1921.**

George H. Ferguson, Jr., University of Maine, Orono, Me.

**University of Pennsylvania Student Chapter, Organized 1920.**

Ashby B. Paul, President; Robert Beatty, Secretary, University of Pennsylvania, Philadelphia, Pa.

**University of Pittsburgh Student Chapter, Organized 1921.**

W. E. Marshall, President; Paul H. Young, Secretary, University of Pittsburgh, Pittsburgh, Pa.

**University of Texas Student Chapter, Organized 1921.**

Ralph S. Windrow, President; Luis Tinoco, Secretary, University of Texas, Austin, Tex.

**University of Washington Student Chapter, Organized 1921.**

G. B. Richardson, President; Grace Eugenie Morrill, Secretary, University of Washington, Seattle, Wash.

**University of Wisconsin Student Chapter, Organized 1921.**

Herbert Wheaton, President; Olaf N. Rove, Secretary, University of Wisconsin, Madison, Wis.

**Virginia Military Institute Student Chapter, Organized 1921.**

Benjamin F. Parrott, Secretary, Virginia Military Institute, Lexington, Va.

**Washington University Collimation Club Student Chapter, Organized 1920.**

Harold T. Smutz, President; Raymond Schuermann, Secretary, Washington University, St. Louis, Mo.

**Yale University Student Chapter, Organized 1921.**

W. G. Geile, President; P. W. Thompson, Secretary, Winchester Hall, New Haven, Conn.

**PRIVILEGES OF ENGINEERING SOCIETIES  
EXTENDED TO MEMBERS OF THE  
AMERICAN SOCIETY OF CIVIL ENGINEERS**

Members of the American Society of Civil Engineers will be welcome in the Reading Rooms and at the meetings of many engineering societies in all parts of the world. A list of such societies will be found on pages 48, 49, and 50 of the Year Book of the Society for 1921.

## NEW BOOKS\*

(From April 1st to April 30th, 1921)

The statements made in these notices are taken from the books themselves, and this Society is not responsible for them.

### DONATIONS TO ENGINEERING SOCIETIES LIBRARY

#### HIGH TENSION SWITCH GEAR.

By Henry E. Poole. (Pitman's Technical Primer Series.) Lond. and N. Y., Sir Isaac Pitman & Sons, Ltd., 1921. 118 pp., illus., 7 x 4 in., boards. \$1.00.

The book gives a brief, general account of the subject. The more important points in the design are considered, but highly technical details are omitted, the object being to present the fundamental principles in a practical manner, so that the volume will fill the need for a handy survey of the subject for those who have not time for elaborate treatises.

#### THE ELECTRIC LAMP INDUSTRY.

By G. Arncliffe Percival. (Pitman's Common Commodities and Industries.) Lond. and N. Y., Sir Isaac Pitman & Sons, Ltd. 112 pp., illus., 7 x 5 in., cloth. \$1.00.

A brief non-technical account of the development of electric lamps, with descriptions of the types in use to-day and the methods of manufacture. Not intended as a technical treatise, but for those desiring a general knowledge of the subject.

#### RADIOTELEGRAPHISCHES PRAKTIKUM.

By H. Rein. Dritte Auflage, von K. Wirtz. Berlin, Julius Springer, 1921. 557 pp., illus., diagrams, 9 x 6 in., cloth. 120 marks.

The needs of the engineer in charge of radio-telegraph and radio-telephone stations are considered in this volume on the technique of plant operation. The various machines and apparatus are described, and their erection, methods of operation, and maintenance explained. Directions are given for the necessary measurements, and the derivation of the more important equations is given. The work has been considerably expanded in scope since the publication of the second edition in 1910.

#### MARINE AND STATIONARY ENGINES.

By A. H. Goldingham. Second Edition, Revised and Enlarged. N. Y., Spon & Chamberlain; Lond., E. & F. N. Spon, 1921. 206 + 27 pp., illus., pl., tab., 8 x 5 in., cloth. \$3.15.

This treatise is offered to designers and operators in need of concise, practical information on the various types and designs of Diesel engines. The book opens with a brief account of the theory of the engine. This is followed by a description of the details of construction, and discussions of indicator diagrams, of the advantages and disadvantages of Diesel engines, and of their operation and maintenance. These general topics are followed by descriptions of many types of engines, illustrated by drawings.

#### THE MARINERS' HANDBOOK.

By International Correspondence Schools. Third Edition. Scranton, Pa., International Textbook Co., 1920. 405 pp., pl., illus., 5 x 4 in., cloth. \$1.50.

A small pocketbook of information on nautical matters, intended for young men in the naval and merchant marine service, and for laymen interested in nautical affairs. Although the treatment is brief, it is sufficient for ordinary reference purposes.

#### THE TESTING OF MOTIVE-POWER ENGINES.

By R. Royds. Second Edition. Lond. and N. Y., Longmans, Green and Co., 1920. 392 pp., diagrams, tab., 9 x 6 in., cloth. \$7.50.

This book is intended for students with an elementary knowledge of motive-power engineering, who desire information on the practical testing of motive-power engines. Special attention is given to the variable conditions under which a plant may operate and the necessity for systematic arrangements where a series of trials is contemplated. This edition has been revised and modified to meet modern developments.

\* Unless otherwise specified, books in this list have been donated by the publishers.



**CAM DESIGN AND MANUFACTURE.**

By F. B. Jacobs. N. Y., D. Van Nostrand Co., 1921. 121 pp., illus., 9 x 6 in., cloth. \$2.00.

This book is intended for machine designers and cam makers, as a practical aid in laying out and cutting cams. The writer has avoided mathematical formulas. Contents: Machine Cam Design; Gas Engine Cam Design; Cam Followers; Master Cams; Machine Work on Cams and Cam Cutters; Cam Cutting; Cam Grinding.

**PATTERN-MAKING.**

By Ben Shaw and James Edgar. (Pitman's Technical Primer Series.) Lond. and N. Y., Sir Isaac Pitman & Sons, Ltd., 1921. 108 pp., illus., 7 x 4 in., boards. \$1.00.

This little volume gives a bird's-eye view of the subject, for use by students, apprentices, young journeymen, and others who wish some knowledge of the principles that underlie it.

**FOUNDRY MOULDING MACHINES AND PATTERN EQUIPMENT.**

By Edwin S. Carman. Second Edition. 225 pp., illus., 9 x 6 in., cloth. (Gift of The Osborn Mfg. Co., Cleveland, Ohio.)

As shown by its contents, this book is intended to explain the construction of moulding machines and their use for various kinds of moulds. The methods of pattern mounting and moulding are described in detail and very fully illustrated by photographs. Contents: General Moulding Principles; The Theory of Jolt Ramming; Roll Over Jolt Moulding Machines; Roll Over Jolt Moulding Machines for Large Size Moulds; Roll Over Jolt Machines for Medium Size Moulds; Roll Over Jolt Machines for Small Size Moulds; Jolt Moulding Machines in Brass and Aluminum Foundries; Plain Jolt Moulding Machines; Air-Operated Squeezer Machines; Jolt Stripper Moulding Machines; Pattern Equipment; Flask Equipment; Machine Moulded Cores; Foundations for Jolt Ramming Moulding Machines.

**GAS TORCH AND THERMIT WELDING.**

By Ethan Viall. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 442 pp., illus., 9 x 6 in., cloth. \$4.00.

This is a careful summary of American practice and equipment, selected from the existing literature, from shop data, and from the experience of experts. The materials and apparatus used, the methods, and their application to particular kinds of work, are described in detail, providing a large amount of practical information for workmen and engineers.

**THE WELDING ENCYCLOPEDIA.**

Compiled and Edited by L. B. Mackenzie and H. S. Card. Welding Engineer Publishing Co., 1921. 224 pp., illus., 9 x 6 in., cloth. \$5.00.

This book is a collection of information on oxy-acetylene, electric, and thermit welding, arranged in concise alphabetical form for ready reference. The material has been largely selected from the files of the *Welding Engineer*, and is practical rather than theoretical in character.

**GASOLINE AUTOMOBILES.**

By James A. Moyer. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 261 pp., illus., 8 x 5 in., cloth. \$2.00.

The purpose of this book is to present clearly, briefly, and interestingly, the essential principles of automobile construction. It is expected to furnish practical help to drivers who wish to know the causes of ordinary operating troubles and the ways to remedy them.

**CHILTON TRACTOR INDEX:**

Vol. 4, No. 1, January, 1921. Phila., Chilton Co. 456 pp., illus., tab., 10 x 7 in., paper. \$2.00.

This semi-annual handbook is a reference book for those interested in tractors and farm power machinery. It includes a directory of manufacturers of tractors, specifications of those on the market, with illustrations of most of them, a directory of manufacturers of farm-power machinery, electric plants, motor trucks, etc., and a list of makers of tractor parts and equipment. General articles and tables of data valuable to makers and users are also included.

**ERGEBNISSE DER AERODYNAMISCHEN VERSUCHSANSTALT ZU GOTTINGEN;**

Pt. 1. By L. Prandtl. München und Berlin, R. Oldenbourg, 1921. 140 pp., plans, illus., tab., 11 x 8 in., paper. 40 marks.

This publication, the first of a series of bulletins devoted to the experimental investigations undertaken by this research laboratory, gives the hitherto unpublished results of recent researches.

These are chiefly concerned with the shapes and profiles of propeller blades, although minor investigations of the reciprocal effect of wings and propellers and bodies and propellers and of the frictional resistance of wing fabrics are included. The bulletin gives results of tests of almost all the blade forms that have been used or investigated in Germany during recent years. The work also describes the organization, equipment, and methods of the laboratory, and a summary introduction to the theory of air resistance, including the new theory of flight.

#### METALLOGRAPHY:

Pt. 2, *The Metals and Common Alloys*. By Samuel L. Hoyt. N. Y. and Lond., McGraw-Hill Book Co., Inc., 1921. 462 pp., illus., tab., 9 x 6 in., cloth. \$5.00.

The second volume of this treatise on metallography describes the more important metals and alloys. This description includes the constitution and microstructure, the physical and mechanical properties for different heat and mechanical treatments, the effects of the common impurities, and a brief discussion of the uses. Those compositions of particular importance have been treated in more detail and measured values of their important properties are included.

#### ALUMINIUM.

By George Mortimer. (Pitman's Common Commodities and Industries.) Lond. and N. Y., Sir Isaac Pitman & Sons, Ltd. 152 pp., illus., tab., 7 x 5 in., cloth. \$1.00.

This little book gives a clear description, suited to the needs of lay readers and business men, of the processes by which aluminium is made and of its uses in industry, particularly in automobile and aircraft construction, the chemical industry, electro and electrical engineering.

#### THE INTERPRETATION OF RADIIUM AND THE STRUCTURE OF THE ATOM.

By Frederick Soddy. Fourth Edition, Revised and Enlarged. N. Y., G. P. Putnam's Sons, 1920. 260 pp., pl., illus., 8 x 6 in., cloth. \$3.75.

This book is intended as a presentation of the subject in non-technical language, which will bring the ideas involved and their bearing on current thought within the reach of the lay reader. The present edition has been rewritten to correspond with present knowledge, and a second part has been added in which the later developments, particularly those that bear on the problem of the constitution of the atom, are set forth in briefer and less elementary form.

#### THE MATHEMATICAL THEORY OF ELECTRICITY AND MAGNETISM.

By J. H. Jeans. Fourth Edition. Cambridge, University Press, 1920. 627 pp., 10 x 7 in., cloth. \$8.00. (Gift of The Macmillan Co., N. Y.)

There is a certain well-defined range in electro-magnetic theory, the author states, which every student of physics may be expected to have covered with more or less thoroughness before proceeding to the study of special branches or developments of the subject. This book is intended to give the mathematical theory of this range of electro-magnetism, together with the mathematical analysis required in its treatment. It is written for the student and for the physicist of limited mathematical attainments. The main changes in the fourth edition consist in a re-arrangement of the later chapters and the addition of a new chapter on the theory of relativity. This attempts to present the broad outlines of the theory in the simplest possible way, suitable for students who approach the subject for the first time, equipped with such knowledge of general electrical theory as can be gained from the remainder of the book. Contents: Electrostatics and Current Electricity; Magnetism; Electromagnetism; Relativity.

#### A TEXTBOOK OF PHYSICS.

By Louis Bevier Spinney. Revised Edition. N. Y., The Macmillan Co., 1920. 617 pp., illus., 9 x 6 in., cloth. \$4.00.

This textbook is intended for university and college students. It aims to emphasize the practical aspects of the science, to illustrate the laws of physics as far as possible by reference to familiar phenomena, and to exemplify principles by discussing their applications. Particular emphasis is placed on the subject of Mechanics. An attempt has been made to include a description of every phenomenon and an exposition of every experimental law that contributes directly to the logical development of the general subject, while avoiding digressions and unimportant phenomena not necessary to such development.

#### THERMODYNAMICS AND CHEMISTRY.

By F. H. Macdougall. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Ltd., 1921. 391 pp., tab., 9 x 6 in., cloth. \$5.50.

This book is intended for the advanced student in chemistry, for whom the author has endeavored to write a book which, in addition to being accurate, logical, and sufficiently rigorous, will furnish him with numerous examples of the application of the principles of the science.

**A DICTIONARY OF CHEMICAL SOLUBILITIES, INORGANIC.**

By Arthur Messenger Comey. Second Edition, Enlarged and Revised by A. M. Comey and D. A. Hahn. N. Y., The Macmillan Co., 1921. 1141 pp., tab., 9 x 6 in., cloth. \$14.00.

This important compendium of data on the solubility of inorganic chemical substances, published twenty-five years ago, has long been out of print, so that a new edition will be welcome. The new issue includes the results that have been published since the issue of the first edition, and the information has been re-arranged and re-edited, so that it is now a complete record on the subject.

**A DICTIONARY OF APPLIED CHEMISTRY; VOL. I.**

By Sir Edward Thorpe. Revised and Enlarged Edition. Lond.\*and N. Y., Longmans, Green and Co., 1921. 752 pp., illus., 9 x 6 in., cloth. \$20.00.

The new edition of this standard reference work has been carefully revised, with the assistance of many specialists, in the light of modern developments. Many new articles have been added and certain existing ones recast or wholly rewritten. The additional matter has made it necessary to reset the type and to increase the work from five to six, and possibly seven, volumes. It is expected to complete the work during the next two years. As the most complete work on applied chemistry in English, its publication is an event of importance to a wide circle.

**BIBLIOTHECA CHEMICO-MATHEMATICA;**

Catalogue of Works in Many Tongues on Exact and Applied Science. Compiled and Annotated by H. Z. and H. C. S. Lond., Henry Sotheran and Co., 1921. 2 vol., ports., fac-similes, 9 x 6 in., cloth. £3. 3s.

This catalogue was begun in 1906 as that of a large collection of books on exact and applied science, offered for sale by a well-known English bookseller. Successive expansions and supplements were added until the final form records over 17 000 important works in its field. The catalogue has been compiled with great care. Full bibliographical particulars are given, accompanied by the current price and by many historical and biographical notes. One hundred and twenty-seven photographic illustrations, including fac-similes of portraits, illustrations, and textual passages from important works add interest. An elaborate subject index adds greatly to the value of the book.

**FOOD INSPECTION AND ANALYSIS.**

By Albert E. Leach. Revised and Enlarged by A. L. Winton. Fourth Edition. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Ltd., 1920. 1090 pp., pl., illus., tab., 10 x 7 in., cloth. \$8.50.

This standard handbook for public analysts and others interested in the subject, has been thoroughly revised and enlarged after an extensive examination of the literature.

**AMMONIA AND THE NITRIDES.**

By Edward B. Maxted. Phila., P. Blakiston's Son and Co., 1921. 116 pp., 7 x 5 in., cloth. \$2.00.

This small volume gives a short account of the experimental work and general principles underlying the commercial synthesis of ammonia, and also a statement of our knowledge of the nitrides. A chapter on active nitrogen is also included. References to the original publications make the book a convenient summary of the scattered literature on these important subjects.

**CONDENSED DESCRIPTION OF THE MANUFACTURE OF BEET SUGAR.**

By Franz Murke. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Ltd., 1921. 175 pp., tab., 9 x 6 in., cloth. \$2.50.

This book is concisely written in plain language. It describes the most commonly used machinery and the chemical and physical reactions of the process, discusses the ordinary and frequently recurring irregularities, and gives directions for overcoming them. The text is based on long experience in the industry.

**THE COTTON TEXTILE WORKER'S HANDBOOK.**

By International Correspondence Schools. Second Edition. Scranton, Pa., International Textbook Co., 1921. 367 pp., illus., tab., 5 x 4 in., cloth. \$1.00.

This is not a condensed cyclopedia, but a useful reference book, really small enough for the pocket, containing tables, rules, and other information often required by those engaged in making cotton goods.

**THE PRACTICE OF SILVICULTURE,**

With Particular Reference to Its Application to the United States. By Ralph C. Hawley. N. Y., John Wiley & Sons, Inc.; Lond., Chapman & Hall, Ltd., 1921. 352 pp., illus., 8 x 5 in., cloth. \$4.00.

The lack of any recent book on the production of wood crops applicable to the forests of this country has led the author to prepare this brief text, containing such information as appears applicable to-day or likely to be applicable in the near future. The book is well equipped with bibliographies.

**STRUCTURAL AND FIELD GEOLOGY.**

By James Geikie. Fourth Edition, Revised. N. Y., D. Van Nostrand Co., 1920. 454 pp., pl., illus., 9 x 6 in., cloth. \$7.50.

Geikie's handbook is intended primarily for beginners in field geology, but is also for students preparing for mining and civil engineering and other professions in which some knowledge of structural geology is of practical importance. It is distinguished by the freshness and terseness of its descriptions, the clearness and abundance of its illustrations. In this edition the scope and method of earlier issues is retained, but definitions have been modified in accordance with current usage, and many descriptions have been altered.

**COST ACCOUNTING TO AID PRODUCTION.**

By G. Charter Harrison. N. Y., The Engineering Magazine Co., 1921. 234 pp., pl., 9 x 6 in., cloth. \$7.50.

The author of this volume believes that the customary methods of cost accounting are entirely unsuited to the needs of modern industry. Cost accounting, in his opinion, should not be a compilation of information concerning past events, but a method of predetermining costs. His book discusses the proper functions of an accounting system and how to secure them, but is chiefly intended to stimulate thought and provoke discussion of the subject.

**HUMAN ENGINEERING;**

A Study of the Management of Human Forces in Industry. By Eugene Wera. N. Y. and Lond., D. Appleton & Co., 1921. 378 pp., 8 x 5 in., cloth. \$3.50.

This volume is a contribution to the discussion of the relationship of labor, capital, and society in the industrial development of the world. Neither the old nor the modern school of management has succeeded in removing labor unrest, owing, in the author's opinion, to the ignoring of labor as a social group and disregard of the social purpose of industry. To present the principle of stimulating labor as a whole toward production at large for social purposes is the object of the present work. The author studies the evolution of the ideas governing industrial relations, interprets the essentials of present issues, presents certain democratic tendencies, and develops a typical organization for class co-operation. Other sections analyze the different psychological associations of men involved in industry, discuss the principles of human engineering, and outline their application.

**HERBERT HOOVER; THE MAN AND HIS WORK.**

By Vernon Kellogg. N. Y. and Lond., D. Appleton and Co., 1920. 375 pp., port., 8 x 5 in., cloth. \$2.00.

Dr. Kellogg's book is the attempt of an observer, associate, and friend to tell, simply and straightforwardly, the personal story of the man and his work up to the present. His boyhood education, work in Australia, China, and London are recounted briefly, and much space given to his work for the relief of Belgium, as American Food Administrator and as American Relief Administrator. As appendixes are given four important addresses by Mr. Hoover.

**JOHN DALTON.**

By L. J. Neville-Polley. (Pioneers of Progress.) Lond., Society for Promoting Christian Knowledge; N. Y., The Macmillan Co., 1920. 63 pp., port., 7 x 5 in., cloth. 80 cents.

This brief biography gives the essential facts concerning Dalton's life, but is chiefly devoted to his scientific labors and their influence on chemistry. These are described carefully with as much detail as is usually wanted.

**MUNICIPAL ACCOMPLISHMENT IN CITY PLANNING.**

Edited by Theodora Kimball. Bost., National Conference on City Planning, 1920. 79 pp., 9 x 6 in., paper.

This pamphlet summarizes the answers to a questionnaire sent to about 125 American cities that have been interested in city planning. It forms a convenient record of what has been accomplished in this direction during recent years, and lists the specific reports that have been made for the different cities.



**THE ELECTRIFICATION OF RAILWAYS.**

By H. F. Trewman. (Pitman's Technical Primer Series.) Lond. and N. Y., Sir Isaac Pitman & Sons, Ltd., 1920. 78 pp., diagrams, 7 x 4 in., boards. \$1.00.

This little volume is an outcome of the discussions as to the advisability or otherwise of electrifying the railroads of Great Britain, a subject of general interest because of the necessity for relieving railway congestion and utilizing coal in the most economical manner. Without going into technical details covered in books on electric traction, the author brings forward the commercial aspect of the matter and calls attention to some of the main questions to which thought must be given. Sufficient electrical information is included to enable these points to be understood by readers who are not electricians.

**MAINTENANCE OF WAY CYCLOPEDIA.**

Compiled and Edited by E. T. Howson, E. R. Lewis, and K. E. Kellenberger, Assisted by Homer Hughes. N. Y., Simmons-Boardman Publishing Co., 1921. 860 pp., pl., illus., diagrams, 12 x 9 in., cloth. \$15.00.

The aim of the editors of this volume has been to present, in the simplest terms and the most convenient grouping, information covering a wide variety of subjects of interest to railroad employees, division officers in charge of maintenance, operating officers having supervision over maintenance, purchasing agents, and manufacturers. To accomplish this they have selected that which is representative of the best in this field, set forth the standards approved by technical societies, and described devices of proved value. The text is divided into sections covering Track, Bridges, Buildings, Water Service, Signals, Wood Preservation, and General Subjects. The arrangement of each section is alphabetical, and the treatment deals with classes of appliances rather than with individual devices. A catalogue section gives detailed information on specific contrivances. The volume contains more than 2500 illustrations.

**FIRE TESTS OF BUILDING COLUMNS.**

By Associated Factory Mutual Fire Insurance Companies, the National Board of Fire Underwriters, and the Bureau of Standards, Jointly Conducted at Underwriters' Laboratories, Chicago, 1917-19. 388 pp., illus., charts, tab., 9 x 6 in., cloth. \$2.50.

This pamphlet presents the results of an investigation undertaken to ascertain the ultimate resistance against fire of protected and unprotected columns as used in the interior of buildings, and their resistance against impact and sudden cooling from hose streams when highly heated. The results of ninety-one fire and fifteen fire and water tests are given, including tests of representative types of steel, cast-iron, concrete-filled pipe and timber columns, protected and unprotected, and reinforced concrete columns. It is stated to be the most complete investigation ever made.

**ÉLÉMENTS DE MÉCANIQUE À L'USAGE DES INGÉNIEURS:**

Résistance des Matériaux. By Robert d'Adhémar. Paris, Gauthier-Villars et Cie., 1921. 185 pp., diagrams, 9 x 6 in., paper.

In writing this book the author has attempted an introduction to the theory of the resistance of materials, in which the hypotheses that have been adopted to simplify the subject in practice are set forth as briefly and simply as possible.

**DIE WÄRMEVERLUSTE DURCH EBENE WÄNDE**

Unter Besonderer Berücksichtigung des Bauwesens. By Karl Hencky. München und Berlin, R. Oldenbourg, 1921. 124 pp., illus., tab., 10 x 7 in., paper. 26 marks.

This work is based on extensive experiments on the heat conductivity of walls of the usual types and of the customary building materials, carried out at the Munich Technical High School. From the results of these and general laws of the conduction of heat, the author has formulated equations to be used in designing heating installations. The book is intended for architects and for engineers engaged in the design of heating plants, as a practical aid in calculating the size of installations.

**TACHEOMETER TABLES.**

By Henry Louis and G. W. Caunt. Lond., Edward Arnold, 1919. 40 pp., tab., 9 x 6 in., cloth. \$3.50. (Gift of Longmans, Green & Co.)

This set of tables is published to popularize the method of tacheometric surveying and to lighten the labors of surveyors desiring to use it. A discussion of the principles of this method and instructions in field and office work are included.

**NOTES ON IRRIGATION, ROADS, AND BUILDINGS, AND ON THE WATER SUPPLY OF TOWNS.**

By William Lumisden Strange. N. Y., E. P. Dutton & Co., 1921. 849 pp., pl., illus., 9 x 6 in., cloth. \$18.00.

In this volume an engineer with thirty years' experience on public works, chiefly in the Indian Public Works Department, presents the results of his professional career for the benefit of younger members of the Profession. The book does not deal with matters of design, formulas, and similar material available in the usual treatises, but discusses general principles and constructive details. Much the largest section of the book is devoted to irrigation, which is discussed in considerable detail. The other subjects, town water supplies, roads, and buildings are treated briefly. The book refers especially to Eastern conditions, and is intended to aid engineers there, who are usually general practitioners, called on to carry out many kinds of work.

**REPORT ON THE SAN FRANCISCO BAY MARINE PILING SURVEY.**

Prepared Under the Supervision of the San Francisco Bay Marine Piling Committee of the American Wood-Preservers' Association. San Francisco, The Committee, 1921. 104 pp., map, pl., tab., 9 x 6 in., paper.

Attacks by marine borers on marine piling in San Francisco Bay, first noticed in 1914, assumed serious proportions from 1917 to 1920, leading to the appointment in the latter year of a special committee to study the problem. The investigation here reported was carried out by the San Francisco Bay Marine Piling Committee, the Forest Products Laboratory, and the University of California, along hydrographic, biological, and engineering lines, to determine the extent of the damage, the present distribution and history of the marine borers, the factors influencing their activity, the effectiveness of the methods of protecting wooden piling and of its substitutes, and to collect data on the relative costs of different methods of protection and construction. This report, one of progress, gives an account of the work done to January, 1921, and the conclusions reached.

## MEMBERSHIP

(From April 8th to May 5th, 1921)

## ADDITIONS

MEMBERS	Date of Membership.
AMIS, JOHN CARL. Chf. Engr., Detroit & Mackinac R. R., East Tawas, Mich.....	April 25, 1921
BURGESS, CHARLES CALVIN. Chf. Engr., Pittsburgh Constr. Co., 811 Diamond Bank Bldg., Pittsburgh, Pa.....	April 25, 1921
COCHRAN, CHARLES WEEDON. Room 1200, Burlington Bldg., Chicago, Ill.	April 25, 1921
COLLINGS, EDWARD ZANE. Capt., Engrs., U. S. A., 150 Yolanda Park Court, San Anselmo, Cal.....	Mar. 7, 1921
HARBER, HAROLD JAY. City Engr., 692 Fourteenth Ave., Paterson, N. J.	April 25, 1921
JACOBY, CLARK ELLSWORTH. (Clark E. Jacoby Eng. Co.), 527 Shukert Bldg., Kansas City, Mo.....	April 25, 1921
MAY, EDWARD ABNER. Pres., May & Smith, Inc., Elec. Light Bldg., Patchogue, N. Y.....	April 25, 1921
SAMANS, WALTER. Chf. Engr., The Atlantic Refining Co., 3144 Passyunk Ave. (Res., 2522 South 20th St.), Philadelphia, Pa.....	Assoc. M. Nov. 3, 1915 M. Mar. 8, 1921
SAWYER, PHILIP. Archt. (York & Sawyer), 50 East 41st St., New York City.....	April 25, 1921
SMITH, WILLIAM HENRY. Mgr., Production Dept., The Brown Hoisting Machinery Co., 4403 St. Clair Ave., Cleveland, Ohio.....	April 25, 1921
SUMNER, MERTON ROGERS. Chf. Engr., Arthur D. Little, Inc., 30 Charles River Rd., Cambridge, Mass.....	Assoc. M. May 13, 1918 M. Mar. 8, 1921
TARRANT, FRED. Maintenance Engr., Dept. of Public Works and Bldgs., 1342 Dial Court St., Springfield, Ill.....	Assoc. M. Oct. 10, 1916 M. Jan. 18, 1921
WELKER, PHILIP ALBERT. Personnel Officer, U. S. Coast and Geodetic Survey, Somerset House, 1801 Sixteenth St., N. W., Washington, D. C.....	April 25, 1921
WHITHAM, PAUL PAGE. China Mgr., The Foundation Co., Am. P. O. Box 667, Shanghai, China.....	Assoc. M. Oct. 1, 1912 M. Jan. 18, 1921

## ASSOCIATE MEMBERS

ADAMS, ROBERT EUGENE. Chf. Asst. Engr., Office of State Highway Engr., 205 Euclid Ave., Atlanta, Ga.....	Mar. 7, 1921
BAUMAN, WILLIAM HARRY. Highway Commr., Thayer County, Box 104, Hebron, Nebr.....	Mar. 7, 1921
BROOKS, ROBERT BLEMKE. Gen. Supt., The Moreno-Burkham Const. Co., 1213 Syndicate Trust Bldg., St. Louis, Mo.....	April 25, 1921
CLOVER, IRA NEWTON. Office Engr., Cleveland Branch, Morris Knowles, Inc., 1004 Hanna Bldg., Cleveland, Ohio.....	Nov. 9, 1920
DAMON, HENRY HYMAN. Constr. Engr., Boston Bldg. Dept., 71 Westminster Ave., Roxbury, Mass.....	April 25, 1921
DIVER, MORTIMER LEVERING. Cons. Engr., Box 69, San Antonio, Tex...	April 25, 1921
DOAN, JOSEPH EARL. 1630 South Norton Ave., Los Angeles, Cal.....	Nov. 9, 1920
ELL, CARL STEPHENS. Dean, Co-operative School of Eng., Northeastern Coll., Boston 17, Mass.....	April 25, 1921
FLINDT, VILHELM. Civ. Engr. and Surv., Storm Lake, Iowa.....	April 25, 1921

ASSOCIATE MEMBERS (*Continued*)

		Date of Membership.
GARCIA, PEDRO. Chf. Hydrographer, Peruvian Irrig. Service; Office Mgr. and Asst. to Cons. and Const. Engr., Irrig. Works, Peruvian Govt., Box 35, Lima, Peru..	} Jun. Assoc. M.	Dec. 6, 1915
HAHN, CLIFFORD AYLWARD. Engr., Stone & Webster, Inc., 147 Milk St., Boston, Mass.....		Mar. 7, 1921
HAMMOND, MARK ARTHUR. Chf. Draftsman, Submarine Boat Corporation, Newark, N. J.....		April 25, 1921
HAWKINS, JOSEPH WASHBURN. Div. Engr., State Highway Dept., 608 Walton Bldg., Atlanta, Ga.....		April 25, 1921
HELLER, GEORGE EDGAR. County Engr., Lake County, Tavares, Fla....		Nov. 9, 1920
HICKEY, BENJAMIN JOHN. Const. Engr., 355 East 149th St., New York City.....		April 25, 1921
HUTTON, HAROLD STEPHENS. Pittsburgh Representative, Wallace & Tiernan Co., Inc., 341 Oliver Bldg., Pittsburgh, Pa.....	} Jun. Assoc. M.	Nov. 25, 1919
JAMES, FREDERICK CARLYLE. Chf. Draftsman, Office of Chf. Engr., N. & W. Ry., 16 Gainsboro Apartments, Roanoke, Va.....		April 25, 1921
KRAMER, WILLIAM DANIEL. Supt. and Engr., Beechwood Farm, Care, F. A. Vanderlip, Scarborough, N. Y.....		April 25, 1921
LACKEY, OTIS BRANTLEY. Asst. Engr., So. Ry. System, 1428 R St., N. W., Washington, D. C.....		Nov. 9, 1920
LAME, HERMAN FOX. Field Engr. and Office Representative, Purdy & Henderson Co., 40 Fairview Ave., Jersey City, N. J.....		April 25, 1921
LANDON, COLUMBUS GRANT. Contr. Engr., 929 North Shartel Ave., Oklahoma, Okla.....		April 25, 1921
LUTZ, WILLIAM GEORGE. Hydr. Engr., Guggenheim Bros., 507 Second St., Brooklyn, N. Y.....		April 25, 1921
MILLER, FRANK BERNARD. Estimator and Designing Engr., Hydraulic Steelcraft Co., 3889 West 19th St., Cleveland, Ohio.....		April 25, 1921
MILLER, WALTER GRADY. Gen. Mgr., Moultrie Constr. Co., 4th Floor, Commercial Bldg., Moultrie, Ga.....		April 25, 1921
MORSE, FREDERICK THURLOUGH. Eng. Dept., A., T. & S. F. Ry., 1268 Boswell Ave., Topeka, Kans.....	} Jun. Assoc. M.	Nov. 12, 1913
OBEE, FLOYD PETER. Highway Engr., 2723 Cherry St., Toledo, Ohio....		April 25, 1921
O'DONNELL, RAYMOND. Associate Prof., Hydr. and San. Eng., The Pennsylvania State Coll., 119 South Atherton St., State College, Pa...		April 25, 1921
STRUTHERS, DAVID LINDSAY. Civ. Engr., George A. Fuller Co. Carolina Shipyard, 11 North 8th St., Wilmington, N. C.....	} Jun. Assoc. M.	Mar. 14, 1916
THOMAS, EDWARD JUSSLEY. 1002 West Lafayette Ave., Baltimore, Md.		April 25, 1921
TRIMBLE, WILLIAM FOSTER, JR. Office Mgr. and Field Engr. (W. F. Trimble & Sons Co.), 1917 Pennsylvania Ave., N. S., Pittsburgh, Pa.....		April 25, 1921
WAGGENER, ROBERT GARNETT. Asst. Engr., Tex. & Pac. R. R., 1003 Texas and Pacific Bldg., Dallas, Tex.....		Jan. 17, 1921
WALDROP, JOHN DOUGLAS. Div. Engr., State Highway Comm., Box 811, Greensboro, N. C.....		April 25, 1921
WARD, CHARLES JOHNSON. Structural Designer, New Stadium, Ohio State Univ., Care, Y. M. C. A., 36 South 3d St., Columbus, Ohio..		April 25, 1921
WATSON, GEORGE JAY. Care, Am. Bridge Co., Elmira Heights, N. Y....		April 25, 1921



ASSOCIATE MEMBERS (*Continued*)

	Date of Membership.
WHITE, JOHN JOSEPH. Asst. to Cost Engr., Merchant Shipbuilding Corporation, 1523 Wilson Ave., Harriman, Pa.....	April 25, 1921
WILLIAMS, STANLEY NEALE. 319 South Ave., Westfield, N. J.....	April 25, 1921
WONNING, HARVEY HENRY. Constr. Engr. and Supt. of Constr., Henry L. Doherty & Co., 60 Wall St., New York City.....	Jan 17, 1921

## JUNIORS

FRANK, JACOB. 92 Quitman St., Newark, N. J.....	Nov. 9, 1920
GOULD, EDWIN FISH. Care, Mead & Seastone, State Journal Bldg., Madison, Wis.....	Jan. 17, 1921
HEATON, EARL OSCAR. Junior Hydrographic and Geodetic Engr., U. S. Coast and Geodetic Survey, Washington, D. C.....	April 25, 1921
JONES, DUDLEY HARWOOD. County Engr., Pottawatomie County, 422 North Kickapoo St., Shawnee, Okla.....	April 25, 1921
LINNELL, HERBERT HARRINGTON. Care, Miranda Sugar Co., Miranda, Oriente, Cuba.....	Dec. 6, 1920
McDOWELL, WILLIAM MILLS. Room 4, Moore and Turner Bldg., Little Rock, Ark.....	April 25, 1921
TOWSLEY, IRVING SIDNEY. Structural Draftsman and Designer, Ballinger & Perrot, 5007 North Sydenham St., Philadelphia, Pa.....	Mar. 7, 1921

## REINSTATEMENTS

## ASSOCIATE MEMBERS

	Date of Reinstatement.
FEELEY, WILLIAM PATRICK.....	April 25, 1921

## RESIGNATIONS

## MEMBERS

	Date of Resignation.
BOND, PAUL STANLEY.....	April 26, 1921
FOWLER, THOMAS WALKER.....	April 26, 1921

## ASSOCIATE MEMBERS

CURTIS, GEORGE DAVE.....	April 26, 1921
GREENE, ALBERT EMERSON.....	April 26, 1921
MAHON, JOHN MONTGOMERY, JR.....	April 26, 1921
YATES, SHELDON SMITH.....	April 26, 1921

## DEATHS

BLAND, GEORGE PIERREPONT. Elected Junior, April 7th, 1875; Member, May 4th, 1881; died April 18th, 1921.
HENDERSON, JOHN BAILLIE. Elected Member, June 4th, 1890; died February 15th, 1921.
TINKHAM, SAMUEL EVERETT. Elected Member, March 2d, 1892; died April 21st, 1921.
WILKINS, WILLIAM GLYDE. Elected Member, December 4th, 1889; died April 12th, 1921.
YATES, PRESTON KING. Elected Junior, June 6th, 1883; Member, April 5th, 1893; died April 22d, 1921.

Total Membership of the Society, May 5th, 1921,  
10 010.